AD-A105 935 MALE (C T) ASSOCIATES SCHENECTADY NY F/G 13/13
NATIONAL DAM INSPECTION PROGRAM. ILION RESERVOIR NUMBER 1 DAM (--ETC(U)
SEP 81 K J MALE DACW51-81-C-0014
UNCLASSIFIED NL

1 OF 2
AD A
105935


A
593

MOHAWK RIVER BASIN

TOWN OF GERMAN FLATTS

HERKIMER COUNTY, NEW YORK

ILION RESERVOIR NO. 1 DAM NY 00186

PHASE I INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

DEPARTMENT OF THE ARMY

NEW YORK DISTRICT, CORPS OF ENGINEERS

26 FEDERAL PLAZA

NEW YORK, NY 10278

JULY 1981

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO AD-A105935	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Phase I Inspection Report Ilion Reservoir No. 1 Dam Mohawk River Basin, Herkimer County, N.Y. Inventory No. 186		5. TYPE OF REPORT & PERIOD COVERED Phase I Inspection Report National Dam Safety Program
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) KENNETH J. MALE		8. CONTRACT OR GRANT NUMBER(s) DACW51-81-C-0014
9. PERFORMING ORGANIZATION NAME AND ADDRESS C.T. Male 3000 Troy Road Schenectady, New York 12309		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS 12 121
11. CONTROLLING OFFICE NAME AND ADDRESS Department of the Army 26 Federal Plaza New York District, CofE New York, New York 10287		12. REPORT DATE 2 September 1981
		13. NUMBER OF PAGES
14. MONITORING AGENCY NAME & ADDRESS (If different from Controlling Office) Department of the Army 26 Federal Plaza New York District, CofE New York, NY 10287		15. SECURITY CLASS. (of this report) UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (

National Dam Inspection Program. Ilion Reservoir Number 1 Dam (NY ØØ186), Mohawk River Basin, Town of German Flatts, Herkimer County, New York. Phase I Inspection Report,

Approved for public release; Distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Dam Safety
National Dam Safety Program
Visual Inspection
Hydrology, Structural Stability
Ilion Reservoir No. Dam
Herkimer County
Mohawk River Basin

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization.

Examination of available documents and visual inspection of the dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies which require further investigation and remedial work.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

412600

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

The downstream slope of the dam is about 1.5H:1V, which is considerably steeper than that of similar dams designed in accordance with modern standards of practice. Therefore, it is recommended that a stability investigation of the embankment, with particular attention to the steepness of the downstream slope, be started within 6 months after receipt of this report by the Owner. Any necessary remedial work should be completed within 18 months after receipt of this report by the Owner. The investigation and the design and construction observation of any remedial work should be done by a qualified, registered professional engineer.

Hydrologic and hydraulic analysis indicates that the PMF overtops the embankment. The 1/2 PMF, however, does not overtop the embankment. Therefore, in accordance with Corps of Engineers' screening criteria for review of spillway adequacy, spillway capacity is considered "inadequate", but not seriously inadequate.

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I Inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test Flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

The Phase I Investigation does <u>not</u> include an assessment of the need for fences, gates, no-trespassing signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety to the public. An evaluation of the project for compliance with OSHA rules and regulations is also excluded.

ILION RESERVOIR NO. 1 DAM, NY 00186

PHASE I INSPECTION REPORT

TABLE OF CONTENTS

APPENDICES

TABLES

NATIONAL DAM INSPECTION PROGRAM

PHASE I INSPECTION REPORT

Identification No.: NY 00186

Name of Dam: Ilion Reservoir No. 1 Dam

State Located: New York

County: Herkimer

Municipality: Town of German Flatts

Watershed: Mohawk River Basin

Stream: Offstream of tributary of Steele Creek

Date of Inspection: June 4, 1981

ASSESSMENT

Examination of available documents and visual inspection of the dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies which require further investigation and remedial work.

The downstream slope of the dam is about 1.5H:1V, which is considerably steeper than that of similar dams designed in accordance with modern standards of practice. Therefore, it is recommended that a stability investigation of the embankment, with particular attention to the steepness of the downstream slope, be started within 6 months after receipt of this report by the Owner. Any necessary remedial work should be completed within 18 months after receipt of this report by the Owner. The investigation and the design and construction observation of any remedial work should be done by a qualified, registered professional engineer.

Hydrologic and hydraulic analysis indicates that the PMF overtops the embankment. The 1/2 PMF, however, does not overtop the embankment. Therefore, in accordance with Corps of Engineers' screening criteria for review of spillway adequacy, spillway capacity is considered "inadequate", but not seriously inadequate.

Because of other deficiencies, the following additional investigations should be started within 6 months after receipt of this report by the Owner. The investigations should be performed by a qualified, registered professional engineer.

1) Investigate the seepage at the downstream toe of the dam.

2) Investigate the cracked and displaced condition of the retaining wall at the downstream toe of the dam.

Any remedial work deemed necessary as a result of these investigations should be completed within 18 months after receipt of this report by the Owner. A qualified, registered professional engineer should design and observe the construction of any necessary remedial work.

The following remedial work should be completed by the Owner within 12 months after his receipt of this report. Where engineering assistance is indicated, the Owner should engage a qualified, registered professional engineer. Assistance by such an engineer may also be useful for some of the other work.

1) Institute a program to visually inspect - not just casually look at - the dam and its appurtenances at least once a month.

2) Repair the deteriorated spillway outlet structure and repair the lesser deterioration of some of the stone masonry on the spillway structure itself.

3) Remove trees, brush, and their root systems from the slopes of the embankment and to a distance of 20 feet downstream from the toe in accordance with specifications and field observation of the work by an engineer. Fill resulting holes with properly selected, compacted fill. Continue to keep these same areas and the crest of the dam clear by cutting, mowing, and cleanup at least annually.

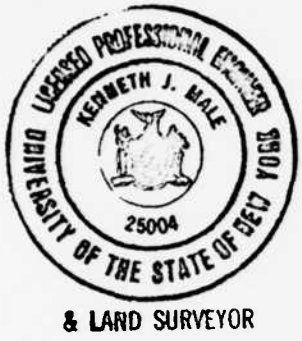
4) Backfill animal burrows on the slopes of the embankment with properly selected, compacted fill.

5) Prepare written routine operation and maintenance procedures for the dam and its appurtenances.

6) Institute a program of comprehensive technical inspection of the dam and its appurtenances by an engineer on a periodic basis of at least once every two years.

7) Develop an emergency action plan outlining action to be taken to minimize the dow stream effects of an emergency, together with an effective warning system.

766



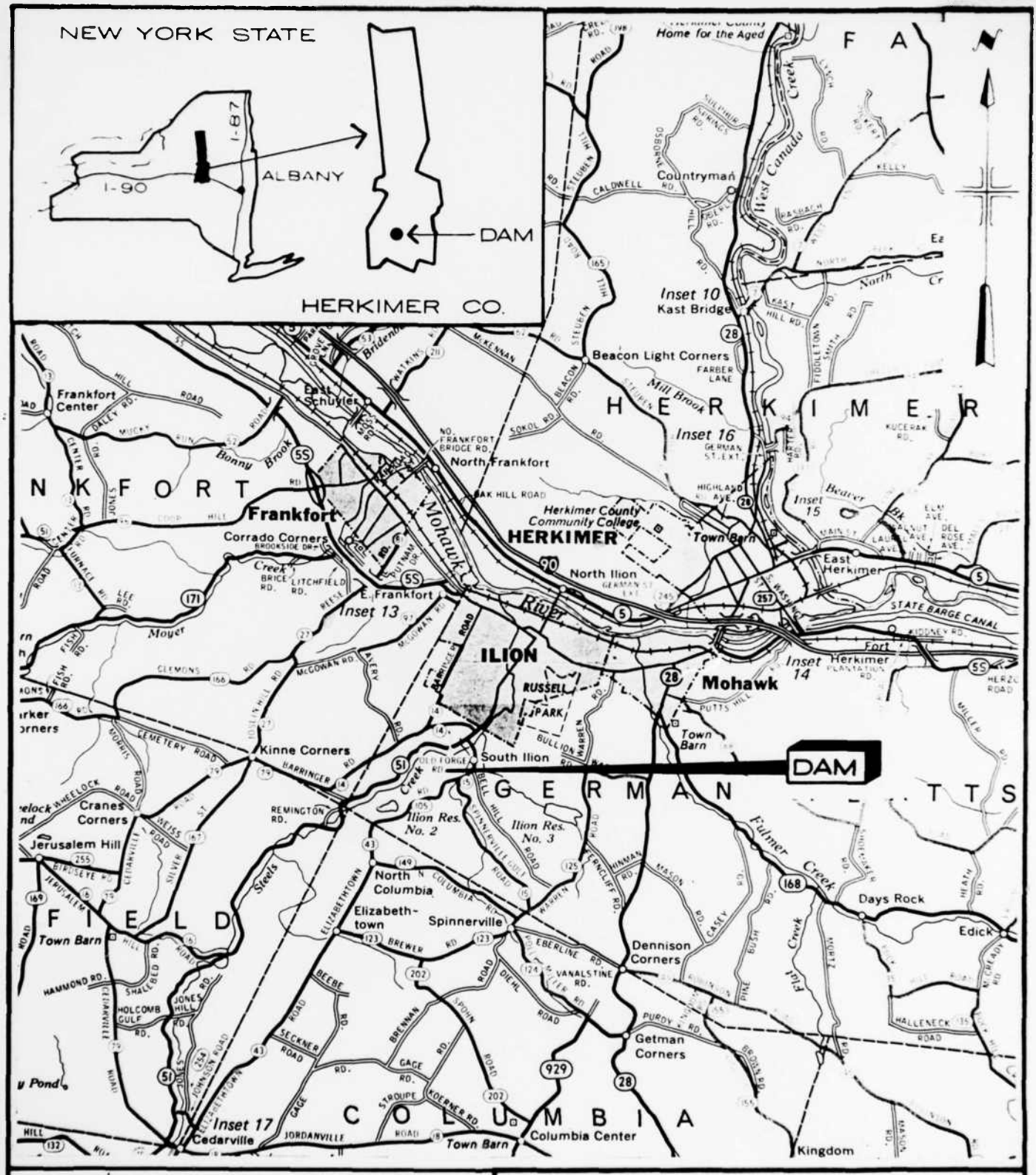
Kenneth J. Male
President
C. T. Male Associates, P.C.
NY PE 25004

Approved by:

Col. W. M. Smith, Jr.
New York District Engineer
Corps of Engineers

Date: 25 Sep 81

Overview Photo - Ilion Reservoir No. 1 Dam from upstream - 6/4/81


NEW YORK STATE
I-87
I-90
ALBANY
DAM
HERKIMER CO.
Home for the Aged
Countryman
Inset 10
Kast Bridge
Beacon Light Corners
Mill Brook
Inset 16
North Frankfort
Frankfort Center
East Schuyler
Bonny Brook
Frankfort
Corrado Corners
Herkimer County Community College
HERKIMER
Town Barn
Inset 15
East Herkimer
North Ilion
E. Frankfort
Inset 13
Mohawk River
STATE BARGE CANAL
ILION
Inset 14
Mohawk
RUSSELL PARK
Kinne Corners
South Ilion
DAM
Cranes Corners
Jerusalem Hill
Ilion Res. No. 2
Ilion Res. No. 3
North Columbia
Elizabeth-town
Spinnerville
Fulmer Creek
Days Rock
Edick
Dennison Corners
Getman Corners
Inset 17
Cedarville
Columbia Center
Kingdom
Town Barn
SCALE OF MILES
0 1 2 3
BASE MAP: HERKIMER CO. HIGHWAY MAP - 1978
PROJECT NO. 58.01.007 / 80.847
ix
ILION RESERVOIR NO. 1 DAM
VICINITY MAP
TOWN OF GERMAN FLATTS
HERKIMER CO., NY
SCALE: 1" = 1.5 MILES
DATE: JANUARY 1981
C.T. MALE ASSOCIATES, P.C.
50 TROY ROAD, SCHODACK, N.Y. 12303

NATIONAL DAM INSPECTION PROGRAM

PHASE I INSPECTION REPORT

NAME OF DAM: ILION RESERVOIR NO. 1 DAM, ID NO. NY 00186

SECTION 1

PROJECT INFORMATION

1.1 GENERAL

a. Authority

The National Dam Inspection Act, Public Law 92-367, August 8, 1972, authorized the Secretary of the Army through the Corps of Engineers to initiate a national program of dam inspection throughout the United States. The New York District of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within New York State. C. T. Male Associates, P.C., has been retained by the New York District to inspect and report on selected dams in the State of New York. Authorization and notice to proceed was issued to C. T. Male Associates, P.C., under a letter from Michael A. Jezior, LTC, Corps of Engineers. Contract No. DACW51-81-C-0014 has been assigned by the Corps of Engineers for this work.

b. Purpose of Inspection

The purpose of the inspection program is to perform technical inspection and evaluation of non-Federal dams to identify conditions which threaten the public, and thus permit correction in a timely manner by non-Federal interests.

1.2 DESCRIPTION OF PROJECT

a. Location

The dam is located offstream of an unnamed tributary of Steele Creek about 1.7 miles southwest of the Village of Ilion. The dam at its maximum section is at Latitude 42 degrees - 59.6 minutes North, Longitude 75 degrees - 3.3 minutes West.

Access to the dam is from Interstate 90 (New York State Thruway) to the north, then west via State Route 5S to the Village of Ilion, then south from Ilion via State Route 51 to Spinnerville Gulf Road (County Route 15), then south via Elizabethtown Road (County Route 105) to the dam. The dam and reservoir are located on the west side of the road (see Vicinity Map, and Drainage Area Map Appendix C-5).

The official name of the dam is Ilion Reservoir No. 1 Dam and the official name of the impoundment is Ilion Reservoir No. 1.

b. Description of Dam and Appurtenances

Ilion Reservoir No. 1 Dam is an earthen embankment about 40 feet high, 270 feet long, and 12 feet wide at the crest, with upstream and downstream slopes of 2H:1V and 1.5H:1V, respectively. There is hand-placed riprap on the upstream slope up to an elevation about 2 feet above reservoir level. Available design drawings indicate that the dam has a stone masonry core wall and puddle core, and that the embankment consists of "fine selected material" on the upstream side and "coarse material" on the downstream side. Both abutments appear to be soil and there are no outcrops of bedrock in the vicinity of the dam.

There is a low earth dike, about 5 feet high and 30 feet long, in a saddle on the perimeter of the reservoir near the right abutment of the dam. The dike has a crest width of about 12 feet and upstream and downstream slopes of about 2H:1V. The top of dike is about at the same elevation as the top of dam.

The dam has an overflow spillway located on the shore of the reservoir near the right abutment. The spillway consists of a 5-foot-wide by 1-foot-high opening into a stone masonry and concrete vault with a slate slab on top. A culvert of unknown size exits the structure and runs about 300 feet down a steep slope to a stone masonry outlet structure. The outlet structure is located next to a ditch which runs along Elizabethtown Road.

The dam has two 16-inch-diameter cast iron pipes which exit from the toe of the dam. One of these pipes is an outlet pipe and the other is a blowoff. There are two valves on the outlet pipe, one located on the downstream slope in a valve box and another located downstream of the dam in a concrete vault with a manhole cover. The outlet pipe runs to the filter plant where it connects with a raw water supply main. The blowoff discharges into the bottom level of the filter plant control building. The valve on the blowoff is located here, with the operating handwheel for the valve located on the top floor of the filter plant control building.

The incoming supply line to the reservoir consists of a 10-inch pipe from Ilion Reservoir No. 2 which connects to an 8-inch pipe from Ilion Reservoir No. 3. Flow in this line can be controlled by 3 valves in series on the pipe near the reservoir. Flow into the pipe can also be controlled with valves at the upstream reservoirs.

c. Size Classification

In accordance with Recommended Guidelines (Reference 1), Ilion Reservoir No. 1 Dam is classified as "intermediate" in size because its height is about 40 feet (within the 40 to 100-foot range). The maximum storage capacity at top of dam is 63 acre-feet.

d. Hazard Classification

In accordance with Recommended Guidelines (Reference 1), Ilion Reservoir No. 1 Dam is classified as having a "high" hazard potential. This is because it is judged that failure of the dam would significantly increase flows downstream which could cause loss of more than a few human lives and appreciable property damage. Downstream development that could be damaged or destroyed by a dam failure includes: the water filtration plant with its various buildings located immediately downstream; portions of Spinnerville Gulf Road (County Route 15) and State Route 51; and the hamlet of South Ilion, with many dwellings, through which the unnamed tributary of Steele Creek runs about 1800 feet downstream of the dam (vertical drop from the dam to the hamlet is about 200 feet).

e. Ownership

The dam was originally constructed for the present owner in 1893. The dam and reservoir are owned by:

Village of Ilion Board of Water Commissioners
P.O. Box 330
Morgan Street
Ilion, NY 13357

Attn: Charles R. Baker, Water Superintendent
(315) 895-7711

f. Operator

Day-to-day operation of the dam is the responsibility of the Village Water Department. The heads of the department are the following:

Charles R. Baker, Water Superintendent
Edward C. Allston, Assistant Water Superintendent
(same address and phone as Owner above, for both)

Also, the Filter Plant Operator, Michael McCormack, (315) 894-9144, operates the reservoir appurtenances.

g. Purpose

The dam was originally constructed as a raw water supply impoundment for the Village of Ilion. It is still used for this purpose.

75

h. Design and Construction History

The dam was designed in 1891 and 1892 for the Village of Ilion. The designer was the Stanwix Engineering Company, Rome, New York, which is no longer in business. Data concerning the original design can be found in Appendices F2, F3, and G. The dam was constructed by a Mr. J. J. Rumsey of Fostoria, Ohio, whose business status is unknown.

There is no knowledge or record of any other construction, modification, or major repair of the dam. Refer to Section 2 of this report, as well as to the Engineering Data Checklist in Appendix F2, for a complete discussion of the design and construction history. Selected plans and other engineering data are included in Appendices F3 and G.

i. Normal Operating Procedures

The water filtration plant is located at the dam site. The Filter Plant Operator records the water level several times daily and the dam appurtenances are operated frequently. All of the valves on the outlet pipe at the dam are normally open and the blowoff is usually closed. Normal pool level is about one foot below the spillway crest. The raw water supply pipe to the reservoir is normally open.

1.3 PERTINENT DATA

a. Drainage Area (acres)	35.6
b. Discharge at Dam Site (cfs)	
Spillway (W.S. at top of dam)	42
Outlet Pipe (maximum flow to filter plant)	1.5
Blowoff (normally closed - estimated potential w/W.S. at Spillway Crest)	40
Maximum Known Flood	Unknown

c. Elevation (feet - NGVD)

All elevations are based on elevations provided by the Owner (see Appendix F3-11) and from plans in Appendix G. They are assumed to be in feet above mean sea level NGVD (National Geodetic Vertical Datum of 1929). The elevations appear consistent with current USGS mapping.

Top of Dam	732
Design High Water	Unknown
Spillway Crest	728.5
Normal Pool	727.5
Entrance Invert of Outlet Pipe	700 ±
Entrance Invert of Blowoff	693 ±

d. Reservoir Length (feet) - at spillway crest 400+

e. Reservoir Surface Area (acres)

Top of Dam	3.5+
Spillway Crest	2.7+
Normal Pool	2.5

f. Reservoir Storage (acre-feet)

Top of Dam	63
Spillway Crest	50
Normal Pool	46

g.

Dam	Dike
Type - Earthen embankment.	Earthen embankment.
Length - About 270 feet.	About 30 feet.
Height - About 40 feet.	About 5 feet.
Top Width - About 12 feet.	About 12 feet.
Side Slopes - Upstream - About 2H:1V.	About 2H:1V.
Downstream - About 1.5H:1V.	About 2H:1V.
Zoning - "Fine selected material" in upstream half of embankment; "coarse material" in downstream half of embankment.	Unknown.
Impervious Core - Stone masonry core wall, with "puddle" against the upstream side of the wall.	Unknown.
Cutoff - Stone masonry core wall and puddle core extend 5 feet below original ground surface.	Unknown.
Grout Curtain - Unknown.	Unknown.

h. Spillway

Type - 5-foot-wide by 1-foot-high overflow opening into stone masonry vault with a discharge culvert from it of unknown size.
Length of Weir - 5 feet.
Upstream Channel - Reservoir immediately upstream of overflow. Normal water level is one foot below overflow crest.
Downstream Channel - Culvert of unknown size from vault, about 300 feet down steep slope to stone masonry outlet structure at ditch near road.

i. Outlet Works

1) Outlet Pipe

Size - 16-inch diameter.
Description - Cast iron pipe from reservoir to filter plant.
Control - Valve in valve box on downstream slope and valve downstream of dam in concrete vault.

2) Blowoff

Size - 16-inch diameter.

Description - Cast iron pipe from reservoir discharging into bottom of filter plant control building.

Control - Valve in bottom of filter plant control building with handwheel control on upper level of building.

SECTION 2

ENGINEERING DATA

2.1 DESIGN DATA

a. Geology

There was no geologic information available in the data for this site. The following information was obtained from current geologic maps and publications for this region (References 26 and 27), as well as from the site visit.

Ilion Reservoir No. 1 Dam is located in the southern New York Section of the Appalachian Plateaus Province and lies on the northern slope of the dissected plateaus of that province. Bedrock in the vicinity of the reservoir consists of shales and siltstones of Upper Ordovician age. No maps are available showing the surficial geology.

b. Subsurface Investigations

No records of subsurface investigations are available for this dam site.

c. Dam and Appurtenances

The dam was designed in 1891 and 1892 by the Stanwix Engineering Company, Rome, New York, which is no longer in business. Some drawings concerning the original design can be found as Appendices G-1 to G-6.

Available design drawings call for a stone masonry core wall extending about 5 feet into the original ground with "puddle" about 5 feet wide against the upstream side of the core wall. The embankment material upstream of the puddle is described on the drawings as "fine selected material," and the embankment material downstream of the core wall is described as "coarse material."

2.2 CONSTRUCTION HISTORY

a. Initial Construction

The dam was constructed in 1892 and 1893 by J. J. Rumsey of Fostoria, Ohio, whose present business status is unknown. No records concerning the actual construction of the dam are known to exist.

A brief review of the construction history, as can be determined from the available data and the Owner, can be found on Appendix F2-2.

b. Modifications, Repairs, and Maintenance

There is no knowledge or record of any reconstruction, modification, or major repair of the dam. Some of the appurtenances are, however, different than some appearing on the original design drawings (see Appendices G-1 & G-3).

c. Pending Remedial Work

There are no known plans for any remedial work at the dam.

2.3 OPERATION RECORD

a. Inspections

There is no known record of inspection of the dam by the Owner.

The only inspection report found for the dam was one done by the NYS-DEC, dated October 19, 1971 (see Appendix F3-1). The report indicated that the dam was in satisfactory condition and received routine maintenance.

b. Performance Observations

Other than the observations made in the one inspection report found (see Appendix F3-1), there are no other known records of performance observations.

c. Water Levels and Discharges

The Filter Plant Operator checks and records the reservoir level several times each day in the plant daily log book. The daily log book has been kept for many years. Rainfall is measured from the period of April to November at the reservoir. The measurements are taken by the Filter Plant Operator and are available from 1948 to the present.

d. Past Floods and Previous Failures

There are no known past floods at or previous failures of the dam.

2.4 EVALUATION

a. Availability

As listed on Appendix F1, various engineering data and records are available in the files of the Owner and the Dam Safety Section of the NYS-DEC. This data was reviewed, and copies of the records significant to the dam are included in chronological

order in Appendices F3 and G. Appendix F2, Checklist for General Engineering Data and Interview with Dam Owner, also contains pertinent engineering information.

'78

b. Adequacy

Available data consisted of some design/construction drawings, an inspection report, and data from the Owner on the dam and its history. Such data as design calculations, specifications, complete design drawings, record drawings, complete data on foundation and embankment soils, and operation and performance data were not available. The lack of such in-depth engineering data does not permit a comprehensive review. Therefore, the available data was not adequate by itself to permit an assessment of the dam.

c. Validity

It is not possible to determine on the basis of the visual inspection alone whether the embankment section was built in accordance with the design drawings. The elevation of the top of the dam is about 1/2 a foot higher than the elevation for top of dam shown on Appendix G-4. The design drawings (see Appendix G-1, G-3 and G-4) also show some appurtenances which are different than some which presently exist.

SECTION 3

VISUAL INSPECTION

3.1 FINDINGS

a. General

Ilion Reservoir No. 1 Dam was inspected on June 4, 1981. The inspection party (see Appendix B-1) was accompanied by: Mr. Charles Baker, Water Superintendent; Mr. Edward Allston, Assistant Superintendent; and Mr. Michael McCormack, Filter Plant Operator, all representing the Owner. The weather was cloudy and warm. The water surface was about 1.4 feet below the spillway crest, or at about EL 727.1, at the time of the inspection. The Visual Inspection Checklist is included as Appendix B, while selected photos taken during the inspection are included as Appendix A and as the Overview Photo at the beginning of this report. Appendix A-1 is a photo index map.

b. Dam and Dike

1) Dam

There were no major sloughs or slides evident on the embankment.

Crest - The crest of the dam is covered with grass which is kept mowed (see Photo A-2A). Many tree roots extend across the top of the crest, from trees on the downstream slope to the upstream side of the crest (see Photo A-2B). The crest appears to be well maintained and shows no signs of settlement, cracking, or horizontal movement.

Upstream Slope - The upstream slope of the dam is covered with handplaced riprap up to an elevation about 2 feet above the water surface in the reservoir, and the riprap is in good condition. Above the riprap, the upstream slope is covered with grass which is kept mowed (see Photo A-3A).

Downstream Slope - The downstream slope of the dam is about 1.5H:1V, which, for a dam of this height (about 40 feet) is considerably steeper than that of similar dams designed in accordance with modern standards of practice. No evidence of creep or sloughing of the slope was observed. The downstream slope is covered with large evergreen trees up to about 18 inches in diameter (see Photos A-3B and A-4A). There are many small (2 to 3-inch-diameter) animal burrows on the downstream slope and one large burrow at Sta 1+80 about 10 feet below the crest of the dam. At the downstream toe of the dam, in the deepest section of the valley, where the

toe of the embankment is retained by a stone masonry and concrete retaining wall, there is a soft, wet area with some standing water next to the base of the retaining wall. This retaining wall is cracked in several places and displaced downstream (see Photo A-4B).

Abutments - Both abutments of the dam appear to consist of soil. No bedrock outcrops were observed in the vicinity of the dam. Trees are growing on the contact between the downstream slope of the dam and the left abutment. Along the contact between the downstream slope and the right abutment, trees are growing on the downstream slope and grass, which is kept mowed, is growing on the abutment itself (see Photo A-5A).

2) Dike

On the south side of the reservoir, near the right abutment of the dam, there is a low dike built across a saddle in the reservoir perimeter (see Photo A-5B). The dike is covered with grass, which is kept mowed, and appears to be in good condition. The upstream slope of the dike is riprapped up to an elevation about 2 feet above the level of water in the reservoir.

c. Appurtenant Structures

1) Reservoir Supply Line

The incoming supply line to the reservoir consists of a 10-inch pipe from Ilion Reservoir No. 2 which connects with an 8-inch pipe from Ilion Reservoir No. 3. This supply pipe was not observable. The Owner, however, indicated that the line is regularly used and that all of the valves on it are operable.

2) Outlet Pipe and Blowoff

The 16-inch cast iron outlet pipe from the dam discharges at the filter plant. The outlet pipe is controlled by 2 valves, one in a valve box on the slope (see Photo A-7A) and another in a concrete vault downstream of the dam (see Photos A-6A and A-6B). The valve on the dam slope does not close fully and is only operated every 2 or 3 years. The valve in the vault is well maintained and operable. The vault itself is also in good condition. The only portion of the outlet pipe observable is the portion through the vault and it appears to be in good condition.

Only the downstream end of the blowoff and the valve on the blowoff, both located in the lower level of the filter plant control building (see Photo A-7B), were observable. The building is in good condition, with some sediment deposited in the bottom due to the operation of the blowoff. The handwheel on the valve is located

'81 on the top floor of the filter plant control building, is used regularly, and is in good condition (see Photo A-8A). The valve and downstream end of the pipe are rusted but still function adequately (see Photos A-8B and A-9A).

3) Spillway

The only parts of the spillway observable were the upstream wall of the stone masonry and concrete vault with the overflow opening (see Photo A-9B) and the downstream stone masonry spillway outlet structure (see Photo A-10A). The culvert between these structures was not observable. The upstream vault wall is eroding at the waterline and there is leakage into the vault through the stone masonry. The spillway outlet structure is falling apart. The stone masonry is displaced and many joints are loose.

d. Reservoir Area

A minor amount of organic silty soil is washing into the reservoir from the adjacent slope at the northwest corner of the reservoir, but there is no evidence of significant sedimentation in the reservoir or of slope stability problems around the perimeter of the reservoir. Photo A-10B shows the reservoir, as well as the aerator structure in the reservoir.

e. Downstream Channel

The spillway from the reservoir discharges through a buried pipe, into a ditch along Elizabethtown Road in Spinnerville Gulf. This gulf is parallel to the small valley on which the dam is located. There is no channel in which water flows downstream of the dam itself. In the deep section of the valley downstream of the dam, there are several water treatment structures and the ground is covered with grass which is kept mowed. No evidence of seepage was observed downstream of the soft, wet area immediately next to the toe of the dam.

3.2 EVALUATION

Many large trees growing on the downstream slope and on the left abutment of the dam could lead to seepage problems and internal erosion (piping) of the embankment if any of the trees blow over and pull out their roots or if any of the trees die and their roots rot.

78? The downstream slope of the dam is steeper than that of similar dams designed in accordance with modern standards of practice and should be evaluated to determine whether it has an adequate factor of safety against failure.

A wet, soft area with standing water near the downstream toe of the dam may indicate a seepage problem which would adversely affect the stability of the dam if not remedied.

The cracked and displaced retaining wall at the downstream toe of the dam is a cause for concern.

Animal burrows on the downstream slope, depending on how deep they extend into the embankment, could become a focus of seepage and piping.

The deteriorated spillway outlet structure could collapse and restrict spillway discharge flows. Also, the deterioration of some of the stone masonry on the spillway structure itself could, in time, seriously weaken the structure if allowed to continue.

78

SECTION 4

OPERATION AND MAINTENANCE PROCEDURES

4.1 OPERATION PROCEDURES

There are no written operation procedures for the dam.

Ilion Reservoir No. 1 is used as part of the public water supply for the Village of Ilion. The valves on the outlet pipe are normally open and the valve on the blowoff is normally closed. Normal pool level is usually about at EL 727.5 or about a foot below the spillway crest. The raw water supply pipe to the reservoir is normally open. Reservoir levels are adjusted daily as water is treated and enters the Village distribution system. The maximum daily outflow from the reservoir is reported to be about 1.0 mgd (about 1.5 cfs).

At the time of the inspection the reservoir level was about 1.4 feet below the spillway crest.

4.2 MAINTENANCE OF DAM AND OPERATING FACILITIES

There are no written maintenance procedures for the dam.

The microstrainer building and office of the water treatment plant is located adjacent to the right abutment of the dam and is manned daily. The Filter Plant Operator checks the reservoir level visually several times daily and records the level in the daily log. The dam crest, dike, and areas immediately around the reservoir are mowed on a regular basis. The riprap around the reservoir is regularly cleaned of brush.

Prior to winter the reservoir is drawn down about a foot by opening the blowoff and closing off the supply pipe to the reservoir. The reservoir is drawn down to prevent ice damage to the riprap. The reservoir is refilled to its normal level each spring.

The blowoff is used regularly to control sediment deposition in the reservoir. In the spring the water level is allowed to rise to about 1 inch over the spillway crest so that the debris on the reservoir surface can be skimmed off.

The valves on the supply line to the reservoir are used regularly. The valve on the outlet pipe, nearest the dam, does not close completely and is only operated every two or three years. The valve on the outlet pipe in the concrete vault is exercised at least once a month.

4.3 EMERGENCY ACTION PLAN AND WARNING SYSTEM

There is no emergency action plan and warning system for the dam.

4.4 EVALUATION

Maintenance of the dam and appurtenances is generally satisfactory. However, the problems associated with conditions near the downstream toe (wet area and displaced retaining wall at toe) and the growth of trees on the dam should be remedied. The operation and maintenance procedures should be organized in writing for ready reference.

The Owner should develop an emergency action plan outlining action to be taken to minimize the downstream effects of an emergency, together with an effective warning system.

SECTION 5

HYDRAULICS AND HYDROLOGY

5.1 DRAINAGE AREA CHARACTERISTICS

Allion Reservoir No. 1 and its dam are located about 400 feet offstream of an unnamed tributary of Steele Creek. Steele Creek flows to the north and discharges into the Mohawk River about 2 miles from the dam site.

The total drainage at the dam is only 0.06 square miles (38.1 acres), of which about 7% (2.5 acres) is actual reservoir surface at the normal pool elevation, one foot below the spillway crest. The topography of the drainage area is characterized by slopes of from 10% to 20%. Elevations in the drainage area vary from EL 727.5 to EL 920. (See Appendices C-5 and C-6).

5.2 ANALYSIS CRITERIA

The U.S. Army Corps of Engineers Hydrologic Engineering Center's Program HEC-1 DB (Reference 3) was used to develop the test flood hydrology and perform the reservoir routing.

The purpose of this analysis was to evaluate the dam and spillway with respect to their surcharge storage and spillway capacity. Accordingly, it was assumed that the water surface was at the normal pool level, EL 727.5, which is about one foot below the spillway crest, at the start of the flood routing. The Filter Plant Operator maintains reservoir levels at or below EL 727.5 at all times by controlling inflow to and outflow from the reservoir. It was assumed that the supply pipe to the reservoir and the outlet pipe and blowoff from it were closed, since their capacities are small and all can be controlled by Water Department personnel.

If the 10-inch supply pipe was assumed open throughout the flood, it is considered that its inflow would be more than matched by outflow through the 16-inch outlet pipe. Also, the 16-inch blowoff could be operated to provide additional discharge capacity in an emergency. Therefore, the result would be even better than for the completely closed condition of the supply and outlet works as modeled.

A constant base flow of 2 cfs per square mile was chosen to represent average conditions in the drainage area and was inputted into the program for all subareas.

The index PMP (probable maximum precipitation) inputted to the HEC-1 DB program was 19.2 inches for a 24-hour duration all-season storm over a 200-square-mile basin, according to HMR 33

(Reference 4). Maximum 6-hour, 12-hour, 24-hour, and 48-hour precipitation for the actual size of the drainage area (same for 10 square miles or less) were inputted to the program as percentages of the index PMP in accordance with HMR 33. A storm reduction coefficient was then applied internally by the program in order to transpose or center the storm over the actual total drainage area. Thus, the corrected 48-hour PMP for the actual total drainage area became 21.8 inches. All rainfall was distributed using the Standard Project Storm arrangement embedded in the program.

Appendix C-7 summarizes the subarea, loss rate, and unit hydrograph data inputted to the program. Only two subareas were used. Subarea 1 consists of all the drainage area around the reservoir, and Subarea 2 consists of just the reservoir surface. For the land in Subarea 1, loss rates were assumed to be 1.0 inch initially and a constant 0.1 inch per hour thereafter. Snyder unit hydrograph parameters were chosen for average conditions. A conservative standard lag time was computed. The program uses the inputted lag time and Snyder peaking coefficient to solve by iteration for approximate Clark coefficients which are then used to calculate the runoff hydrograph.

For the reservoir surface making up Subarea 2, loss rates were set to zero so that rainfall would equal rainfall excess, or runoff. Assuming no delay in the rainfall/runoff response, a constant unit hydrograph for a rainfall duration equal to the HEC-1 DB calculation interval was developed per Appendix C-7 and inputted to the program.

The floods selected for analysis were the PMF (probable maximum flood) and 1/2 PMF. Floods as ratios of the PMF (e.g., 1/2 PMF) were taken as ratios of runoff, not of precipitation. Peak inflow for the PMF is about 211 cfs or 3,517 csm (cfs per square mile). Peak outflow is reduced slightly by reservoir routing to about 209 cfs (3,483 csm). For 1/2 PMF the peak inflow is about 106 cfs (1,767 csm) and the routed peak outflow is about 41 cfs (683 csm).

5.3 RESERVOIR CAPACITY

Storage capacity data for the reservoir was developed using USGS contour mapping (see Appendix C-5) and a known capacity at normal pool, EL 727.5, of 46 acre-feet (15 million gallons, see Appendix F3-5). Area measurements inside contour elevations were obtained from the USGS mapping, and the capacity of the reservoir at various elevations was then computed by hand using the method of conic sections. The computations appear on Appendix C-6.

03 At the spillway crest, EL 728.5, the reservoir has a capacity of 50 acre-feet. At the top of dam, EL 732, the reservoir has a capacity of 63 acre-feet. Surcharge storage between the spillway crest and top of dam amounts to 13 acre-feet, or about 4.1 inches

of runoff from the 38.1-acre drainage area. Therefore, the reservoir has some capacity to attenuate peak inflow.

5.4 SPILLWAY CAPACITY

The dam has a 5-foot-wide by 1-foot-high inlet opening to a vault on the upstream end of a long culvert which discharges to a ditch about 300 feet from the right abutment of the dam.

The discharge capacity of the spillway was taken to be the capacity of the inlet opening of the vault on the upstream end of the culvert. The inlet opening of the spillway was assumed to act as a sharp-crested weir for depths of flow less than or equal to one foot and as an orifice for depths of flow greater than one foot. The spillway discharge computations are presented on Appendix C-8. With water 3.5 feet over the crest of the spillway (i.e., water level at top of dam) the spillway discharges about 42 cfs.

For the service spillway crest at EL 728.5 and the top of dam at EL 732, total discharge computations are summarized on Appendix C-9. Total discharge from the dam is the sum of the discharge from the spillway, plus flow over the dam for the overtopping condition. As discussed previously in Section 5.2, the supply pipe to and the outlet and blowoff pipes from the reservoir were all assumed to be closed. The hand-computed discharges for the spillway were inputted directly to the HEC-1 DB program.

With the reservoir level at the top of dam, EL 732, the total discharge from the dam is just the capacity of the spillway, or about 42 cfs.

5.5 FLOODS OF RECORD

There are no known records of past flood discharges at the dam.

5.6 OVERTOPPING POTENTIAL

The results of the overtopping analysis using the HEC-1 DB program are summarized in Table 5.1. The overtopping analysis computer input and output for the PMF and 1/2 PMF are included starting on Appendix C-10.

As noted from Table 5.1, the PMF overtops the dam by about 0.3 of a foot maximum with duration of overtopping of about 3.3 hours. The 1/2 PMF does not overtop the dam, but instead results in minimum freeboard of about 0.1 of a foot. Peak inflows are 211 cfs for the PMF and 106 cfs for 1/2 PMF. Peak outflow is 209 cfs for the PMF and is reduced significantly by reservoir routing to 41 cfs for 1/2 PMF. Time to maximum stage, or the time from the start of the 48-hour storm to peak outflow, is about 40 hours for the PMF and about

TABLE 5.1

ILION RESERVOIR NO. 1 DAM

OVERTOPPING ANALYSIS

CONDITIONS

Total Drainage Area = 0.06 square miles
Start Routing at Normal Pool EL 727.5
Top of Dam EL 732
Total Project Discharge Capacity at Top of Dam = 42 cfs ± due to spillway. Outlet pipe and blowoff assumed closed.
Some values rounded from computed results.

	PMF	1/2 PMF (a)
INFLOW		
48-hour Rainfall (inches)	21.8	12.8 (b)
48-hour Rainfall Excess (inches) (c)	18.2	9.1 (d)
Peak Inflow (cfs)	211	106
Peak Inflow (csm)	3,517	1,767
OUTFLOW		
Peak Outflow (cfs)	209	41
Peak Outflow (csm)	3,483	683
Time to Peak Outflow (hours)	40.3	42
Maximum Storage (acre-feet)	64	63
Max. W.S. Elevation (feet-NGVD)	732.3	731.9
Minimum Freeboard (feet)	overtopped	0.1
Maximum Depth over Dam (feet)	0.3	not overtopped
Duration of Overtopping (hours)	3.3	n/a

(a) One-half of PMF total runoff, including base flow. For PMF base flow = 2 cfs per square mile = < 1 cfs.
(b) Approximation assuming total losses are the same as for the PMF.
(c) Rainfall Excess = Rainfall for the Reservoir Surface. For the rest of the drainage area, losses are assumed to be 1.0 inch initially and 0.1 inch per hour thereafter.
(d) Equal to one-half of PMF value.

42 hours for 1/2 PMF. The peak portion of the inflow and outflow hydrographs for the PMF and 1/2 PMF are shown by the computer plots on Appendices C-16 and C-17.

5.7 EVALUATION

The PMF overtops the embankment. The 1/2 PMF, however, does not overtop the embankment. Therefore, in accordance with Corps of Engineers' screening criteria for review of spillway adequacy, spillway capacity is considered "inadequate", but not seriously inadequate.

78

SECTION 6

STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

The following visual observations, which are discussed in detail in Section 3, are indicative of potential long-term stability problems at the Ilion Reservoir No. 1 Dam:

1) Steepness of the downstream slope.

2) Trees growing on the downstream slope and left abutment.

3) Seepage near the downstream toe of the dam.

4) Animal burrows on the downstream slope of the dam.

The downstream slope of the dam is about 1.5H:1V, which is considerably steeper than the downstream slope of similar dams designed in accordance with modern standards of practice. An analysis of the stability of the embankment should be made to determine whether it has an acceptable factor of safety against slope failure.

b. Design and Construction Data

Available drawings (see Appendices G-1 to G-4) indicate that the design called for a stone masonry core wall extending about 5 feet into the original ground, "puddle" about 5 feet wide against the upstream side of the core wall, "fine selected material" in the section of the embankment upstream of the core wall and puddle, and "coarse material" in the section of the embankment downstream of the core wall. No construction records are available and it is not possible to determine on the basis of the visual inspection alone whether the dam was built in conformance with these design drawings.

c. Operating Records

The inspection report dated October 19, 1971 by the NYSDEC (see Appendix F3-1) noted the presence of trees on the downstream slope.

d. Post-Construction Changes

No records of post-construction changes pertinent to structural stability are available for this dam.

e. Seismic Stability

This dam is in Seismic Zone 2. According to the Recommended Guidelines (Reference 1), a seismic stability analysis is not required.

6.2 STABILITY ANALYSIS

A structural stability analysis is not required because there are no gravity structures at this dam to analyze.

'22

SECTION 7

ASSESSMENT AND RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

Visual inspection of Ilion Reservoir No. 1 Dam revealed the following deficiencies which affect the safety of the dam:

1) Trees growing on the downstream slope and left abutment.

2) Seepage occurring next to the downstream toe of the dam.

3) A downstream slope of about 1.5H:1V, which is considerably steeper than that of similar dams designed in accordance with modern standards of practice and which may not have an acceptable factor of safety against failure.

4) Animal burrows on the downstream slope.

5) A cracked and displaced retaining wall at the downstream toe of the dam.

6) The deteriorated structural condition of the spillway outlet structure, as well as lesser deterioration of the spillway structure itself.

Hydrologic and hydraulic analysis indicates that the PMF overtops the embankment. The 1/2 PMF, however, does not overtop the embankment. Therefore, in accordance with Corps of Engineers' screening criteria for review of spillway adequacy, spillway capacity is considered "inadequate", but not seriously inadequate.

b. Adequacy of Information

Available information, together with that gathered during the visual inspection, is considered adequate for this Phase I inspection.

c. Need for Additional Investigations

The following detailed engineering investigations should be performed by a registered professional engineer qualified by training and experience in the design of dams:

1) Investigate the stability of the embankment section, with particular attention to the steepness of the downstream slope.

2) Investigate the seepage at the downstream toe of the dam.

3) Investigate the cracked and displaced condition of the retaining wall at the downstream toe of the dam.

d. Urgency

The investigations recommended above in Section 7.1c should be started within 6 months after receipt of this Phase I Report by the Owner.

Any remedial work deemed necessary as a result of these investigations should be completed within 18 months after receipt of this report by the Owner.

Measures recommended below in Section 7.2a should be completed within 12 months after receipt of this report by the Owner.

7.2 RECOMMENDED MEASURES

The following work should be performed by the Owner. Where engineering assistance is indicated, the Owner should engage a registered professional engineer qualified by training and experience in the design of dams. Assistance by such an engineer may also be useful for some of the other work.

a. Complete Within 12 Months

1) Institute a program to visually inspect - not just casually look at - the dam and its appurtenances at least once a month.

2) Repair the deteriorated spillway outlet structure and repair the lesser deterioration of some of the stone masonry on the spillway structure itself.

3) Remove trees, brush, and their root systems from the slopes of the embankment and to a distance of 20 feet downstream from the toe in accordance with specifications and field observation of the work by an engineer. Fill resulting holes with properly selected, compacted fill. Continue to keep these same areas and the crest of the dam clear by cutting, mowing, and cleanup at least annually.

4) Backfill animal burrows on the slopes of the embankment with properly selected, compacted fill.

5) Prepare written routine operation and maintenance procedures for the dam and its appurtenances.

6) Institute a program of comprehensive technical inspection of the dam and its appurtenances by an engineer on a periodic basis of at least once every two years.

7) Develop an emergency action plan outlining action to be taken to minimize the downstream effects of an emergency, together with an effective warning system.

b. Complete Within 18 Months

The following remedial work should be completed by the Owner. A qualified, registered professional engineer should design and observe the construction of the remedial work.

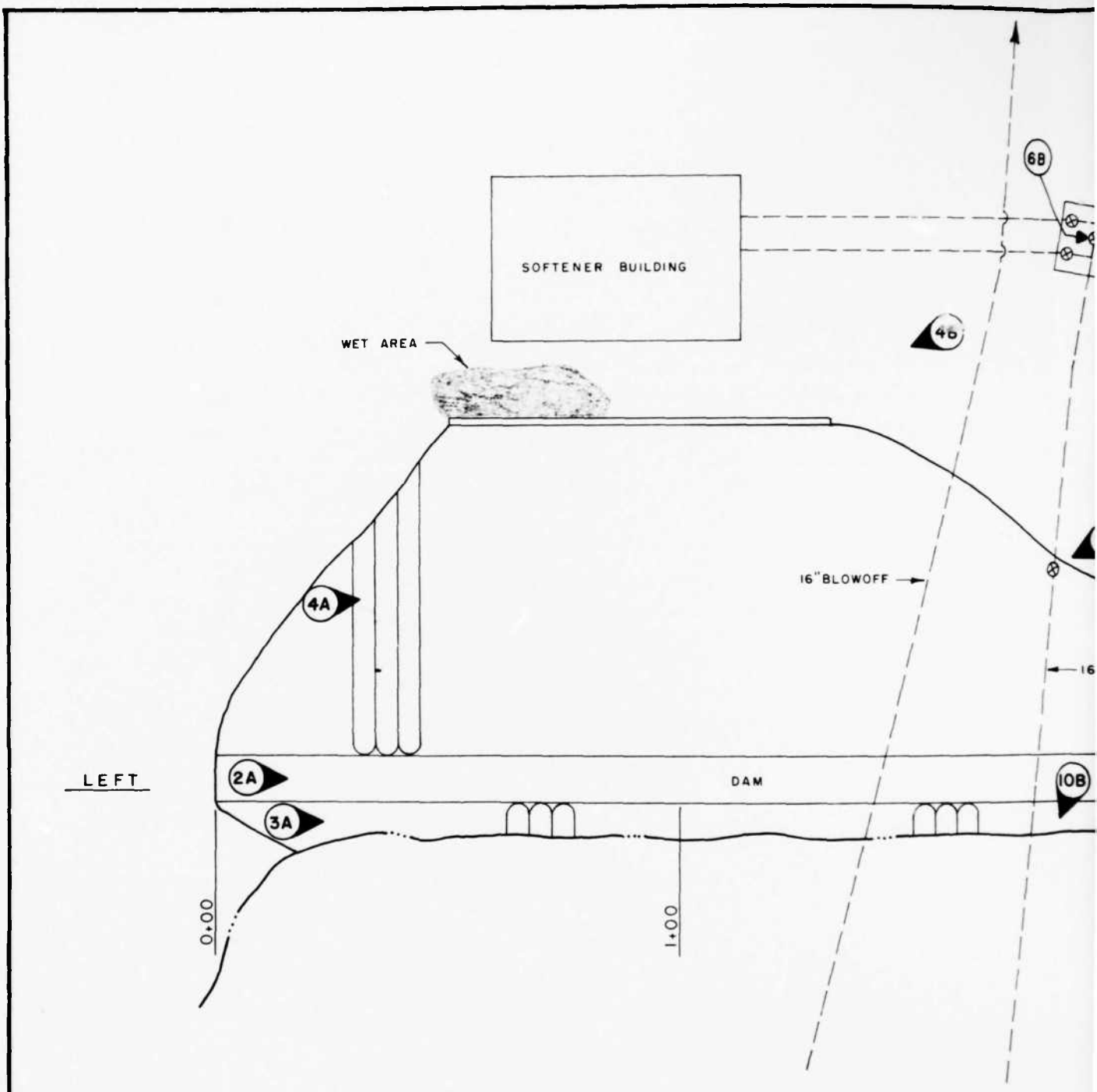
1) Appropriate modifications as a result of the stability investigation of the embankment.

2) Appropriate modifications as a result of investigating the seepage at the downstream toe of the dam.

3) Appropriate modifications as a result of investigating the cracked and displaced condition of the retaining wall at the downstream toe of the dam.

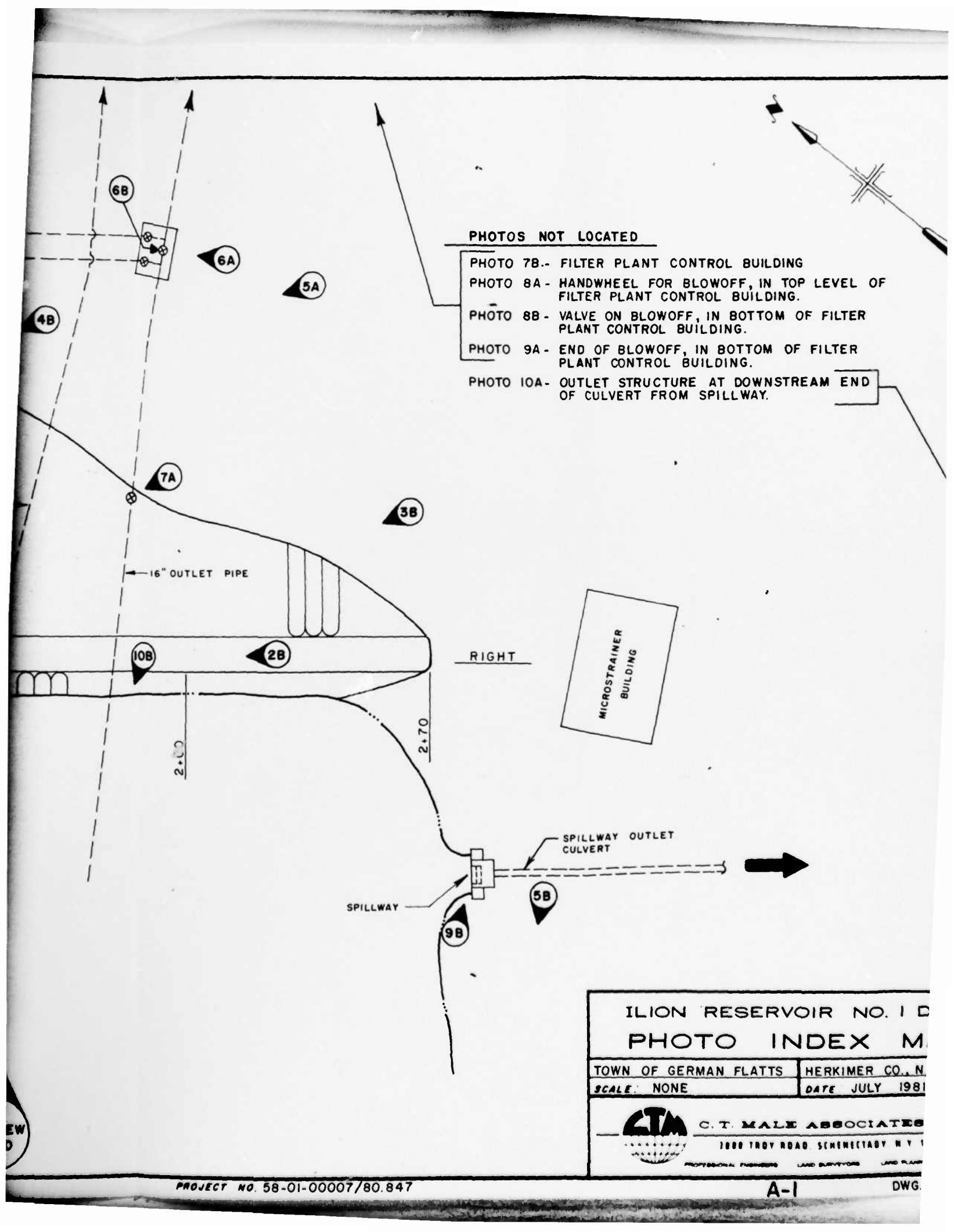
APPENDIX A

PHOTOGRAPHS

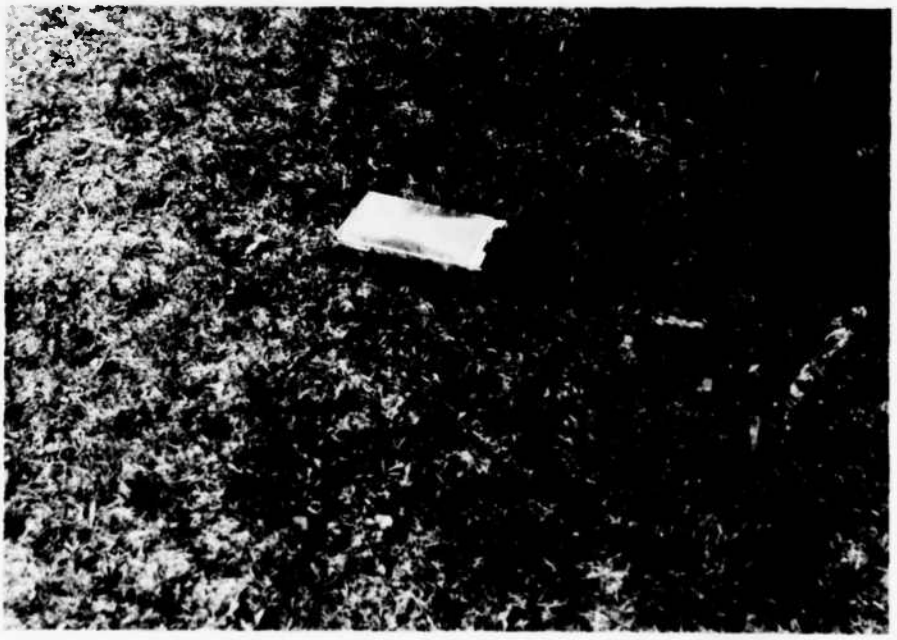


ILION RESERVOIR NO. 1

OVERVIEW PHOTO


PHOTOS NOT LOCATED
PHOTO 7B.- FILTER PLANT CONTROL BUILDING
PHOTO 8A - HANDWHEEL FOR BLOWOFF, IN TOP LEVEL OF FILTER PLANT CONTROL BUILDING.
PHOTO 8B - VALVE ON BLOWOFF, IN BOTTOM OF FILTER PLANT CONTROL BUILDING.
PHOTO 9A - END OF BLOWOFF, IN BOTTOM OF FILTER PLANT CONTROL BUILDING.
PHOTO 10A - OUTLET STRUCTURE AT DOWNSTREAM END OF CULVERT FROM SPILLWAY.
6B
6A
5A
4B
7A
3B
16" OUTLET PIPE
10B
2B
RIGHT
MICROSTRAINER BUILDING
2+70
SPILLWAY OUTLET CULVERT
SPILLWAY
5B
9B
ILION RESERVOIR NO. 1 D
PHOTO INDEX M
TOWN OF GERMAN FLATTS
HERKIMER CO., N
SCALE: NONE
DATE JULY 198
C.T. MALE ASSOCIATES
1000 TROY ROAD SCHENECTADY N Y
PROJECT NO. 58-01-00007/80.847
A-1
DWG.

A-2A Top of dam looking from left abutment - 6/4/81



A-2B Tree roots across top of dam at about Sta 2+20. (Many other tree roots across top of dam at other locations) - 6/4/81

A-3A Upstream slape af dam with hand-placed riprap, laoking fram left abutment. Note microstrainer / treatment plant affice building and entrance ta spillway in backgraund - 6/4/81

A-3B Contact between dawnstream slape and right abutment, with trees on slope and grass an abutment - 6/4/81

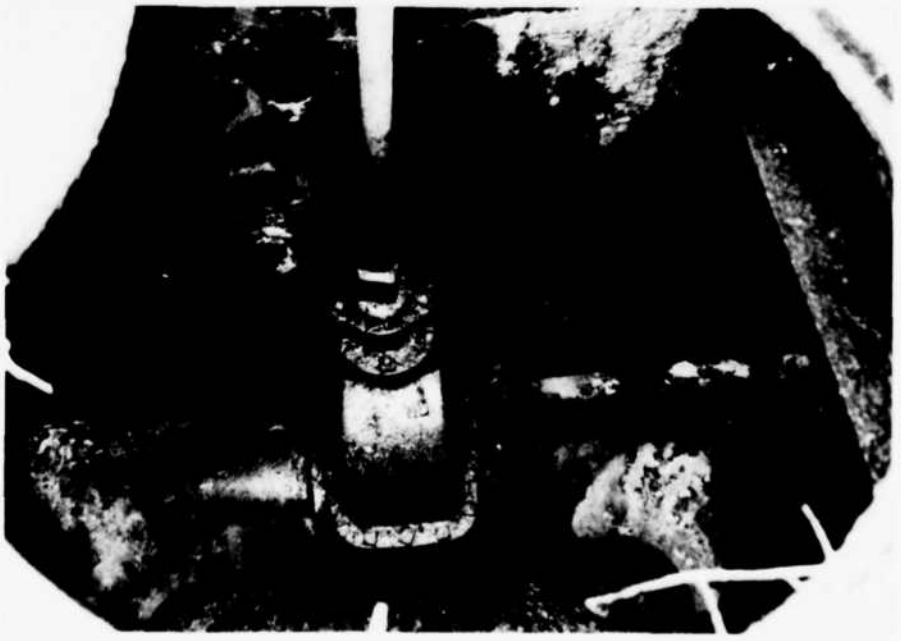
A-4A Downstream slope of dam viewed from left abutment - 6/4/81

A-4B Stone masonry wall at downstream toe of dam - 6/4/81

A-5A Downstream slope of dam near toe viewed from above right abutment. Softener building is at middle right of photo - 6/4/81

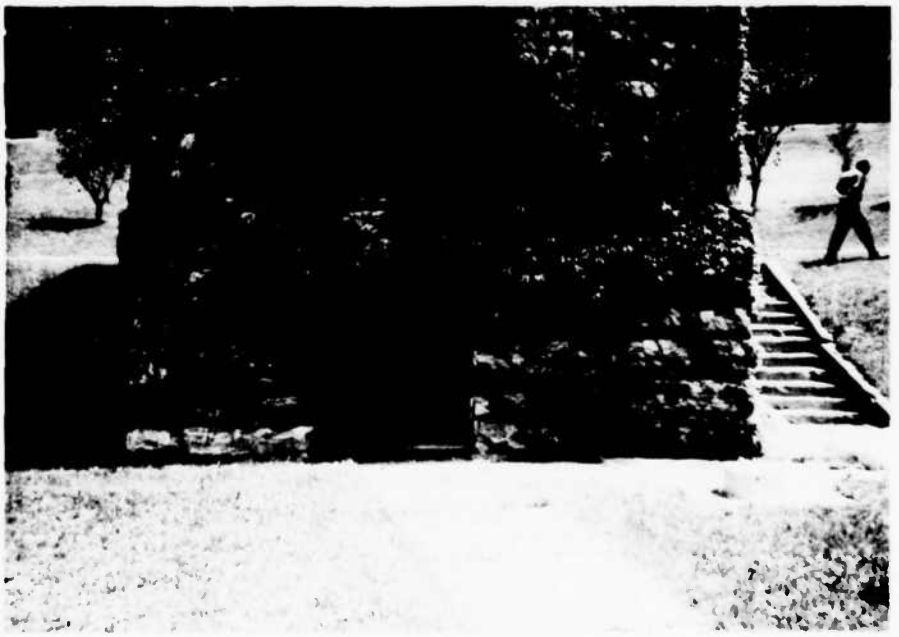
A-5B Downstream side of dike - 6/4/81

A-6A Vault for downstream valve on outlet pipe - 6/4/81



A-6B Downstream valve on outlet pipe, inside vault - 6/4/81

A-7A Valve box on downstream slope of dam for upstream valve on outlet pipe - 6/4/81

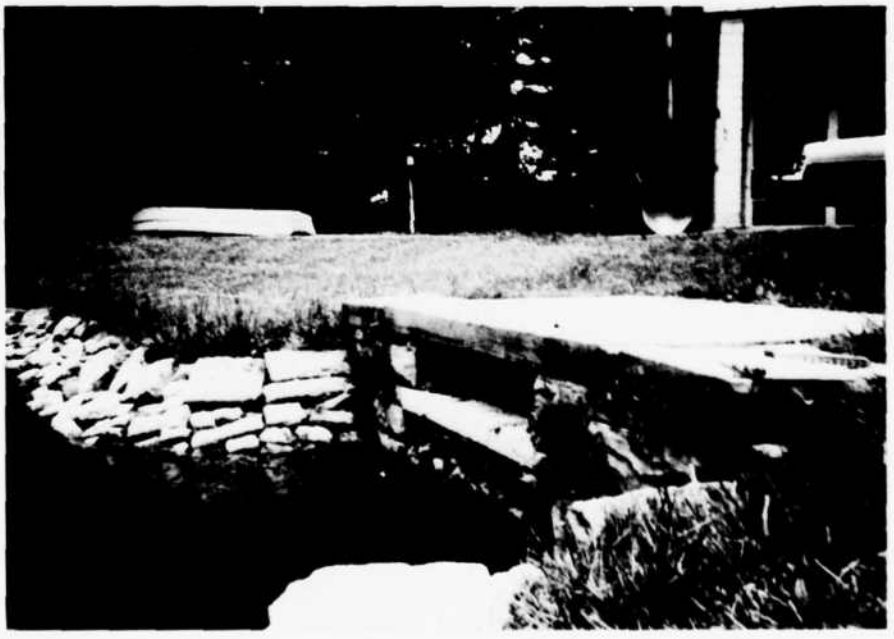


A-7B Filter plant control building. Doorway is entrance to ladder to lower level. End of blowoff and blowoff valve locoted on bottom level and handwheel for valve located on top level - 6/4/81

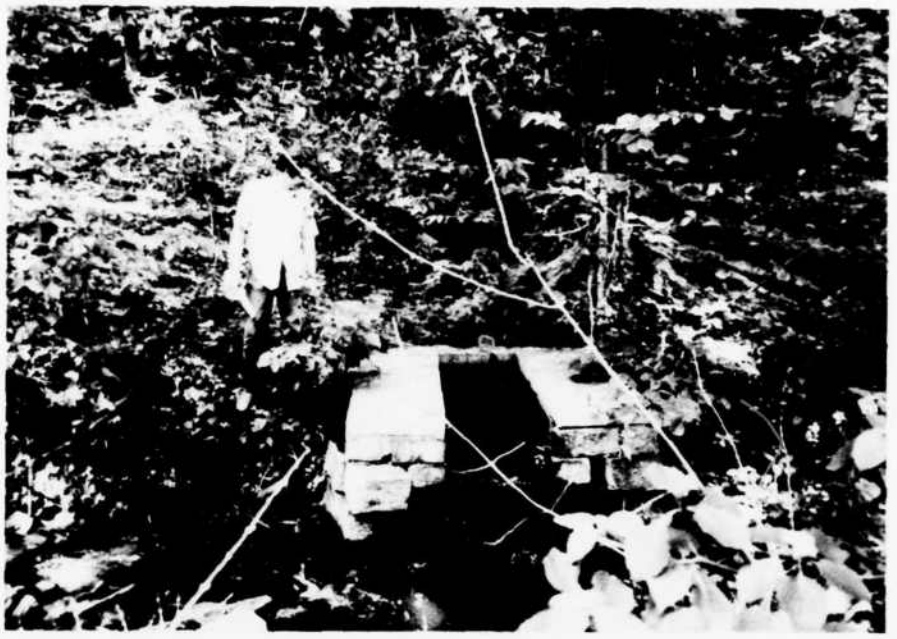
A-8A Top level of filter plant control building with removable handwheel and stem on blowoff valve operating nut - 6/4/81

A-8B Blowoff valve in bottom of filter plant control building - 6/4/81

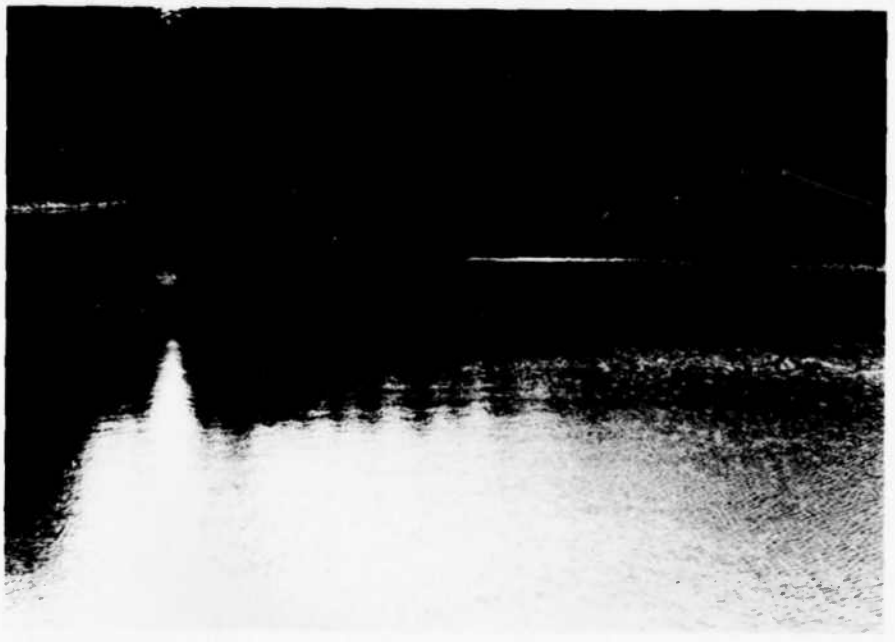
A-9A Downstream end of blowoff valve in bottom of filter plant control building - 6/4/81



A-9B Upstream end of spillway - 6/4/81



A-10A Outlet structure at downstream end of pipe from spillway - 6/4/81



A-10B View of reservoir from center of dam. Note aerator to right of center in photo - 6/4/81

APPENDIX B

VISUAL INSPECTION CHECKLIST

PHASE I

VISUAL INSPECTION CHECKLIST

1. BASIC DATA

a. General

Name of Dam Ilion Reservoir No. 1 Dam

Fed. I.D.# NY00186 DEC Dam No. 690 5

River Basin MOHAWK (UPPER HUDSON)

Location: Town GERMAN FLATTS County HERKIMER

Stream Name OFFSTREAM

Tributary of UNNAMED TRIBUTARY OF STEELE CREEK

Latitude (N) 42° 59.6' Longitude (W) 75° 3.3'

Type of Dam EARTH

Hazard Classification HIGH

Date(s) of Inspection June 4, 1981

Weather Conditions OVERCAST & WARM

Reservoir Level at Time of Inspection 1.4' BELOW SPILLWAY CREST, EL 727.1

b. Inspection Personnel (*Recorder) THOMAS BENNEDUM - CTM, EDWIN VOPELAK JR.* - CTM, RONALD C. HIRSCHFELD* - GEI

c. Persons Contacted (Including Title, Address & Phone No.)

CHARLES R. BAKER, WATER SUPERINTENDANT HOME (315) 894-2348 OFFICE (315) 895-7711

EDWARD C. ALLSTON, ASS'T WATER SUPERINTENDANT (315) 895-7711

ADDRESS FOR ABOVE: BOARD OF WATER COMMISSIONERS, MORGAN ST. P.O. BOX 330, ILION, NY 13357

MICHAEL MCCORMACK, FILTER PLANT OPERATOR (315) 894-9144

d. History

Date Constructed 1892-93 Date(s) Reconstructed

Designer STANWIX ENGINEERING CO.

Constructed By J. J. RUMSEY, FOSTORIA, OHIO

Owner VILLAGE OF ILION BOARD OF WATER COMMISSIONERS

MORGAN ST., P.O. BOX 330, ILION, NY 13357

2. EMBANKMENT

a. Characteristics

GEI 1) Embankment Material Design drawing shows "fine selected material" in upstream shell and "coarse material" in downstream shell.

GEI 2) Cutoff Type Design drawing shows stone-masonry core wall and "puddle" core extending 5 feet below original ground surface.

GEI 3) Impervious Core Design drawing shows stone-masonry core wall and "puddle" core

GEI 4) Internal Drainage System None observed

GEI 5) Miscellaneous No comments

GEI b. Crest

GEI 1) Vertical Alignment Good

GEI 2) Horizontal Alignment Good

GEI 3) Lateral Movement No evidence of lateral movement observed

GEI 4) Surface Cracks None observed

GEI 5) Miscellaneous No comments

GEI c. Upstream Slope

GEI 1) Slope (Estimate H:V) 2H:1V

GEI 2) Undesirable Growth or Debris, Animal Burrows None observed

GEI 3) Sloughing, Subsidence or Depressions No evidence of sloughing, subsidence, or depressions observed

GEI 4) Slope Protection Riprap up to an elevation about 2 feet above reservoir level.

GEI 5) Surface Cracks or Movement at Toe Not visible beneath water surface

GEI d. Downstream Slope

GEI 1) Slope (Estimate - H:V) 1.5H:1V

GEI 2) Undesirable Growth or Debris, Animal Burrows Large trees cover entire downstream slope. One large animal burrow at Station 2+80 about 10 feet below crest of dam. Many small (2 to 3-inch diameter) animal burrows over entire downstream slope.

GEI 3) Sloughing, Subsidence or Depressions No evidence of sloughing, subsidence, or depressions observed.

GEI 4) Surface Cracks or Movement at Toe None observed.

GEI 5) Seepage None observed

GEI 6) External Drainage System (Ditches, Trenches, Blanket) None observed

GEI 7) Condition Around Outlet Structure Not applicable

GEI 8) Seepage Beyond Toe Very soft, wet area with some standing water at downstream toe of dam in deepest section of valley.

GEI e. Abutments - Embankment Contact

GEI 1) Erosion at Contact None observed

GEI 2) Seepage Along Contact None observed

3. DRAINAGE SYSTEM

GEI a. Description of System None observed

GEI b. Condition of System Not applicable

GEI c. Discharge from Drainage System Not applicable

4. INSTRUMENTATION (Monumentation/Surveys, Observation Wells, GEI Weirs, Piezometers, Etc.)

None observed

5. RESERVOIR

GEI a. Slopes Some soil washing into west end of reservoir from adjacent slope.

GEI b. Sedimentation No evidence of significant sedimentation observed.

GEI c. Unusual Conditions Which Affect Dam None observed

6. AREA DOWNSTREAM OF DAM

a. Downstream Hazard (No. of Homes, Highways, etc.) FILTER PLANT BUILDINGS IMMEDIATELY D/S. SEVERAL DWELLINGS LOCATED IN THE HAMLET OF SOUTH ILION & SPINNERVILLE GULF ROAD LOCATED 1800± FEET D/S

GEI b. Seepage, Growth No seepage observed beyond about 20 feet from downstream toe.

GEI c. Evidence of Movement Beyond Toe of Dam

d. Condition of Downstream Channel NONE, RESERVOIR IS OFFSTREAM SPILLWAY DISCHARGES TO DITCH 300'± FROM RIGHT ABUTMENT ALONG ELIZABETHTOWN ROAD.

7. SPILLWAY(S) (Including Discharge Channel)

a. General 5' WIDE BY 1' HIGH OPENING INTO STONE MASONRY & CONCRETE VAULT W/ SLATE SLAB ON TOP. FROM IT IS CULVERT OF UNKNOWN SIZE. CULVERT IS OVER 300' LONG DOWN STEEP SLOPE TO STONE MASONRY OUTLET STRUCTURE AT DITCH ALONG ELIZABETHTOWN ROAD.

b. Conditon of Service Spillway UNOBSERVABLE EXCEPT FOR INTAKE OPENING OF VAULT & D/S OUTLET STRUCTURE. INTAKE OPENING & VAULT - EROSION OF VAULT WALL AT WATERLINE & SOME LEAKAGE INTO VAULT THROUGH STONE MASONRY. OUTLET STRUCTURE - STONE MASONRY IS DETERIORATED & STRUCTURE FALLING APART AT JOINTS

c. Condition of Auxiliary Spillway N/A

d. Condition of Discharge Channel OUTLET STRUCTURE IS AT DITCH ALONG ELIZABETHTOWN ROAD - APPEARS TO BE ADEQUATE ALTHOUGH THERE IS SOME BRUSH IN DITCH.

8. RESERVOIR DRAIN/OUTLET – OUTLET PIPE (RAW WATER MAIN FROM RESERVOIR #1 TO FILTER PLANT)

a. Type: Pipe ✓ Conduit _____ Other _____

b. Material: Concrete _____ Metal ✓ Other _____

c. Size: 16" CIP Length _____

d. Invert Elevations: Entrance _____ Exit _____

SEE H&H DATA CHECKLIST APPENDIX C

e. Physical Condition (Describe)

Unobservable ✓

1) Material _____

2) Joints _____ Alignment _____

3) Structural Integrity _____

4) Hydraulic Capability GOOD

f. Means of Control: Gate ____ Valve ✓ Uncontrolled ____

Operation: Operable ✓ Inoperable ____ Other _____

Present Condition (Describe) 2 VALVES IMMEDIATELY D/S OF 1 VALVE NEAR DAM HARD TO OPERATE (IN VALVE BOX) & DOES NOT CLOSE FULLY. OPERATED EVERY 2 OR 3 YEARS. VALVE IN VAULT OPERATED W/ VALVE WRENCH, USED REGULARLY, WELL MAINTAINED.

g. Other Outlets (water mains, diversion pipes) 16" CIP BLOWOFF VALVE W/ HANDWHEEL IN FILTER PLANT CONTROL BUILDING VALVE OPERABLE, USED REGULARLY, DISCHARGES INTO BOTTOM OF FILTER PLANT CONTROL BLDG., SOME RUST ON VALVE COVERING

9. STRUCTURAL

a. Concrete Surfaces POURED CONCRETE & STONE MASONRY WALL AT TOE IS ONLY STRUCTURAL ELEMENT OF DAM WHICH IS NOT EARTH

b. Structural Cracking STONE MASONRY WALL - ABOUT 6 VERTICAL CRACKS IN WALL. CONCRETE (OLDER) PORTION OF WALL IS PART OF EXTENSION OF CONCRETE VAULT AT TOE WHICH IS USED W/ KEEPER BLDG. & NOT DAM. IS IN GOOD CONDITION

c. Movement - Horizontal & Vertical Alignment(Settlement) D/S RETAINING WALL TILTS D/S

GEI d. Junctions with Abutments or Embankments Not applicable

GEI e. Drains - Foundation, Joint, Face Not applicable

f. Water Passages, Conduits, Sluices ONLY SPILLWAY, 16" OUTLET, & 16" BLOWOFF (SEE 7. & 8.)

GEI g. Seepage or Leakage Not applicable

h. Joints - Construction, etc. JOINT OF STONE MASONRY WALL AT TOE IN GOOD CONDITION

GEI i. Foundation Not applicable

GEI j. Abutments Not applicable

k. Control Gates NONE KNOWN.

l. Approach & Outlet Channels BLOWOFF DISCHARGES TO BOTTOM OF FILTER PLANT CONTROL BLDG. OUTLET PIPE SUPPLIES RAW WATER TO FILTER PLANT. CULVERT FROM SPILLWAY DISCHARGES TO DITCH NEAR ELIZABETHTOWN ROAD. NARROW CHANNEL OF RESERVOIR 5' LONG x 5' WIDE UP TO MOUTH OF SPILLWAY

m. Energy Dissipators (Plunge Pool, etc.) NOT APPLICABLE

n. Intake Structures NOT OBSERVABLE

o. Stability

p. Miscellaneous 2 PIPES FEED INTO RESERVOIR, ONE HAS AERATOR ON ITS DISCHARGE END.

10. APPURTENANT STRUCTURES (Power House, Lock, Gatehouse, Service Bridge, Other)

a. Description: OUTLET PIPE CONTROL VAULT - CONCRETE VAULT W/ MANHOLE COVER THAT CONTAINS OUTLET PIPE CONTROL VALVE (REGULARLY USED) FILTER PLANT CONTROL BLDG. - HANDWHEEL FOR BLOWOFF ON UPPER FLOOR, BLOWOFF DISCHARGE END V VALVE IN BOTTOM OF BLDG. BLDG IS STONE MASONRY

b. Condition: OUTLET PIPE CONTROL VAULT - GOOD CONDITION FILTER PLANT CONTROL BLDG. - GOOD CONDITION, SOME SEDIMENT FROM OPERATION OF BLOWOFF IN BOTTOM OF BLDG.

11. MISCELLANEOUS MECHANICAL/ELECTRICAL EQUIPMENT

a. Description: N/A

b. Condition:

12. OTHER

49

APPENDIX C

HYDROLOGIC AND HYDRAULIC ENGINEERING DATA CHECKLIST AND COMPUTATIONS

TABLE OF CONTENTS

4595

PHASE I INSPECTION

HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA CHECKLIST

Name of Dam ILION RESERVOIR #1 DAM Fed. Id.# NY00186

1. AREA-CAPACITY DATA

	Elevation (ft.)	Surface Area (acres)	Storage Capacity (acre-ft.)
a. Top of Dam	732	3.5±	63
b. Design High Water (Max. Design Pool)	UNKNOWN		
c. Auxiliary Spillway Crest	N/A		
d. Pool Level with Flashboards	N/A		
e. ~~Service~~ Spillway Crest	728.5	2.7±	50
NORMAL POOL	727.5	2.5	46

2. DISCHARGES

	Volume (cfs)
a. Average Daily (MAX DAILY FLOW ≈ 1MGD)	< 1.5 EST.
b. Spillway @ Top of Dam	42
c. Spillway @ Design High Water	UNKNOWN
d. Service Spillway @ Auxiliary Spillway Crest Elevation	N/A
e. Low Level Outlet (BLOWOFF NORMALLY CLOSED W/ W.S. @ SPILLWAY CREST EST Q = 40 CFS)	0
f. Total (of all facilities) @ Top of Dam	42
g. Maximum Known Flood	UNKNOWN
h. At Time of Inspection	<1.5 EST.

4596

3. TOP OF DAM

Elevation 732

a. Type EARTH EMBANKMENT

b. Width 12' Length 270'

c. Spillover 5' WIDE x 1' HIGH ORIFICE W/ CULVERT D/S OF ORIFICE

d. Location ON RIGHT SHORE OF RESERVOIR D/S OF RIGHT ABUTMENT

4. SPILLWAY

	SERVICE	AUXILIARY
a.	728.5 Elevation	N/A
b.	CULVERT Type	
c.	5' WIDE BY 1' HIGH OPENING IN STONE MASONRY WALL W/ CULVERT D/S Width	
	Type of Control	
d.	✓ Uncontrolled	
	Controlled:	
e.	Type (Flashboards; gate)	
f.	Number	
g.	Size/Length	
h.	STONE MASONRY Invert Material	
i.	Anticipated Length of Operating Service	
j.	N/A Chute Length	
k.	~5 Height Between Spillway Crest & Approach Channel Invert (Weir Flow)	
l.	Other	

4597

5. OUTLET STRUCTURES/EMERGENCY DRAWDOWN FACILITIES

a. Type: Gate____ Sluice____ Conduit ✓ Penstock____

b. Shape TWO CAST IRON PIPES - OUTLET PIPE & BLOWOFF

c. Size BOTH 16" DIA

d. Elevations: Entrance Invert OUTLET PIPE - EL 700 BLOWOFF - EL 693

Exit Invert UNKNOWN

e. Tailrace Channel: Elevation N/A

6. FLOOD WATER CONTROL SYSTEM

a. Warning System NONE

b. Method of Controled Releases (mechanisms) OUTLET PIPE VALVE (NORMALLY OPEN) SUPPLIES RAW WATER TO FILTER PLANT BLOWOFF CAN BE OPERATED AS WELL

7. CLIMATOLOGICAL GAGES

a. Type NON-RECORDING RAIN GAGE OPERATED BY VILLAGE WATER DEPT.

b. Location AT FILTER PLANT NEAR RESERVOIR

c. Period of Record 1948 TO PRESENT

d. Maximum Reading UNKNOWN Date

8. STREAM GAGES REFERENCE 23

a. Type WATER - STAGE RECORDER * USGS GAGE # 01346000

b. Location WEST CANADA CREEK AT KAST BRIDGE, N Y

LAT. 43°04'08", LONG. 74°59'26" 26 MILES NORTH OF DAM

c. Period of Record CONTINUOUS FROM 1920 TO PRESENT, OTHERS FROM 1913

d. Maximum Reading 23,300 cfs = 41.9 cms Date MARCH 26, 1913

* HINCKLEY RESERVOIR LOCATED U/S

9. OTHER

6169

10. DRAINAGE BASIN CHARACTERISTICS

a. Drainage Area 0.06 SQUARE MILES (38.1 ACRES)

b. Land Use - Type WOODLAND W/ GRASS AROUND RESERVOIR

c. Terrain - Relief SLOPES AVERAGING 10% TO 20%

d. Surface - Soil GLACIAL TILL?

e. Runoff Potential (existing or planned extensive alterations to existing surface or subsurface conditions)

NONE KNOWN.

f. Potential Sedimentation Problem Areas (natural or man-made; present or future)

SEEPAGE FROM NATURAL SLOPE ABOVE LEFT SHORE OF RESERVOIR IS DEPOSITING SEDIMENTS INTO RESERVOIR ALONG LEFT SHORE

g. Potential Backwater Problem Areas for Levels at Maximum Storage Capacity (including surcharge storage)

NONE KNOWN.

h. Dikes - Floodwalls (overflow & non-overflow) - Low Reaches Along the Reservoir perimeter

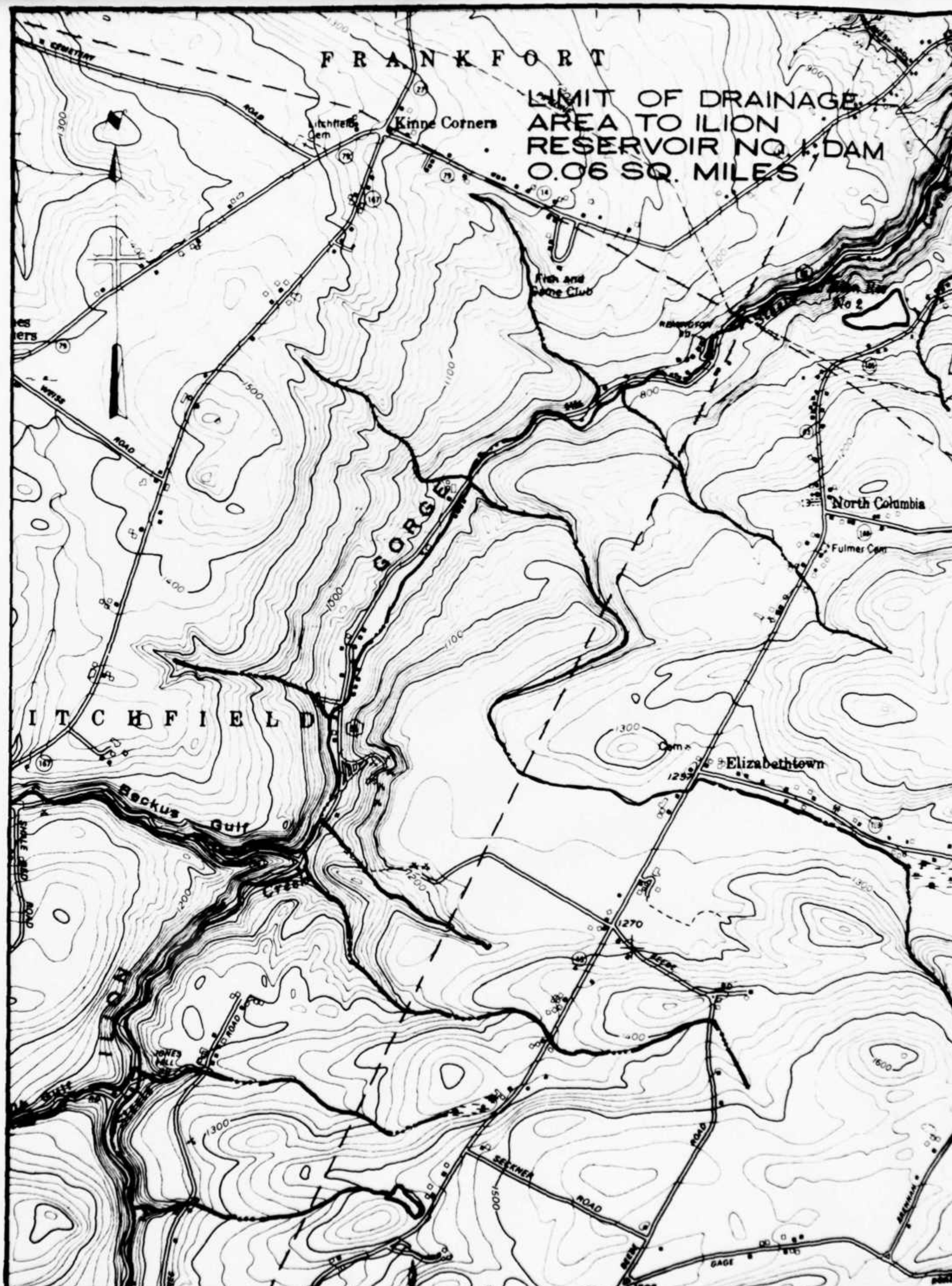
Location LOW AREA OF NATURAL GROUND & DIKE ON RIGHT SHORE OF RESERVOIR U/S FROM DAM.

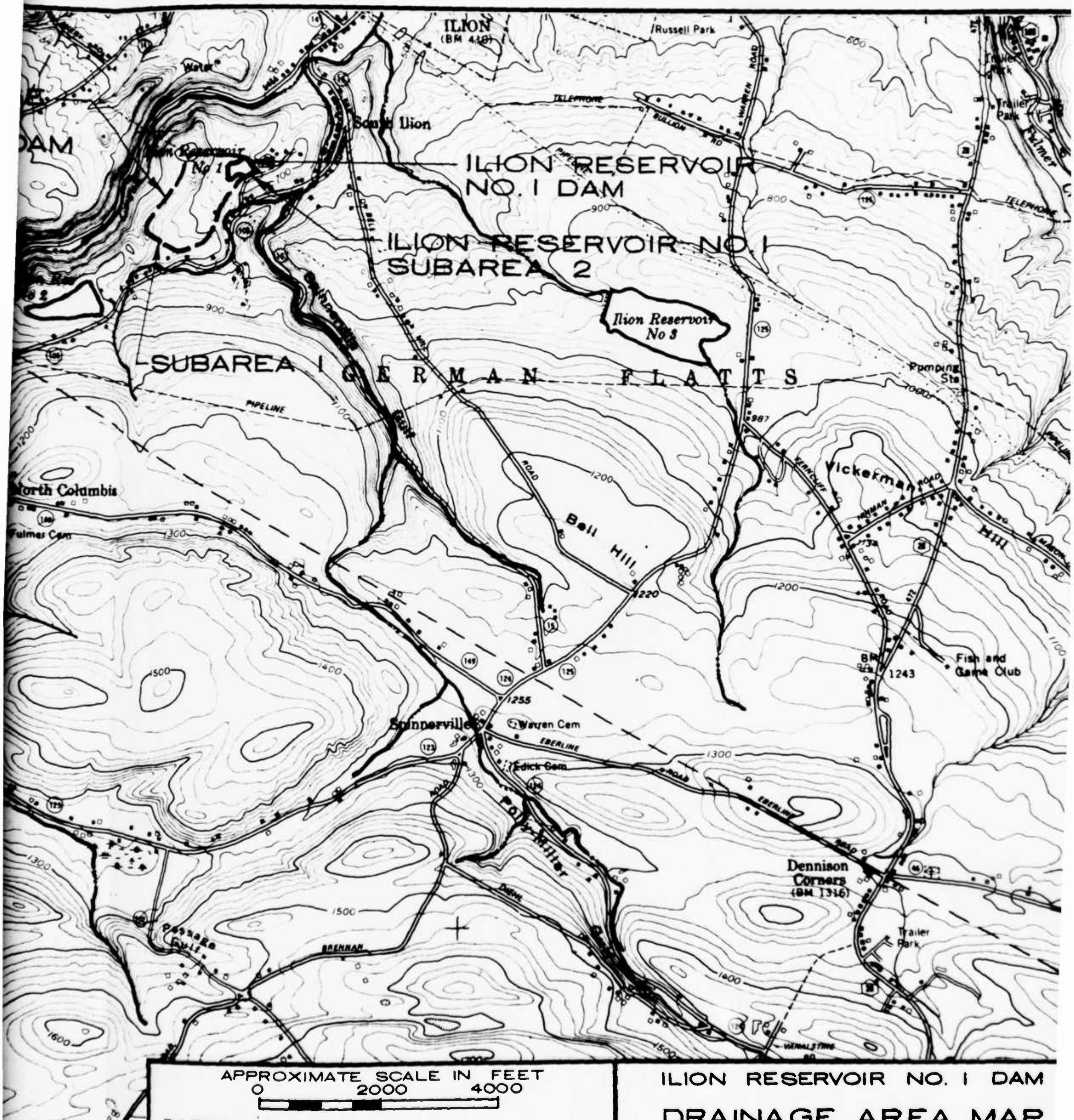
Elevation

i. Reservoir

Length @ ~~Maximum Design~~ SPILLWAY CREST Pool 400'± (feet)

Length of Shoreline (@ Service Spillway Crest) 1200'± (feet)


FRANKFORT
LIMIT OF DRAINAGE AREA TO ILION RESERVOIR NO. 1 DAM 0.06 SQ. MILES
Kinne Corners
Fish and Game Club
North Columbia
Fulmer Cem
GORGE
ITCHFIELD
Elizabethtown
Backus Gulf
Creek
SEEKNER ROAD
GAGE
1270
1300
1500
1100
1200
1400
1600
800
900



APPROXIMATE SCALE IN FEET
0 2000 4000

DATUM - NGVD 1929
BASE MAP-7.5' NYSDOT TOPO QUAD
20' CONTOUR INTERVAL
MILLERS MILLS, N.Y. - 1978

ILION RESERVOIR NO. I DAM

DRAINAGE AREA MAP

TOWN OF GERMAN FLATTS	HERKIMER CO.
SCALE: 1" = 2000'	DATE: JANUARY 1981

C. T. MALE ASSOCIATES, P.C.
3000 TROY ROAD, SCHENECTADY, N.Y. 12309

DWG. NO.

C. T. MALE ASSOCIATES, P.C.
ENGINEERS SURVEYORS ARCHITECTS
LANDSCAPE ARCHITECTS PLANNERS
3000 TROY ROAD, SCHENECTADY, N.Y. 12309
(518) 785-0976

JOB ILION RESERVOIR #1 DAM
SHEET NO ____ OF ____
CALCULATED BY EJV DATE 6/22/81
CHECKED BY GMB DATE 8/12/81
SCALE 80.00847

ELEVATION - AREA - STORAGE COMPUTATIONS

RESERVOIR VOLUME: COMPUTED BY METHOD OF CONIC SECTIONS

$$\Delta V_{1,2} = h/3\,(A_1 + A_2 + \sqrt{A_1 A_2})$$

	ELEVATION (5) (NGVD-FT)	AREA (6) (acres)	INPUT VOLUME (acre-feet)	
	693 (1)	—	0	
NORMAL POOL	727.5 (1)(2)	2.5	46 (4)	15 MILLION GALLONS
SPILLWAY CREST	728.5	2.7 EST.	50 EST.	
TOP OF DAM	732 (3)	3.5 EST.	63 BY PROGRAM	
	740	5.2	93	

(1) FROM PLAN OF EMBANKMENT DATED 1892 (SEE APPENDIX G-4)
(2) FROM DATA PROVIDED BY OWNER (SEE APPENDIX F3-11)
(3) FROM DATA PROVIDED BY OWNER (SKETCH WHICH APPEARS AS APPENDIX G-9)
(4) FROM DATA PROVIDED BY OWNER (SEE APPENDIX F3-5)
(5) RELATIVE ELEVATION DIFFERENCES BETWEEN NORMAL POOL, SPILLWAY CREST, & TOP OF DAM MEASURED IN FIELD. ALL ELEVATIONS ASSUMED NGVD.
(6) FROM USGS TOPOGRAPHIC MAPPING APPENDIX C-5, EXCEPT AS NOTED.

DRAINAGE AREA

	AREA (acres)	AREA (square miles)
WATERSHED DIRECT TO RESERVOIR (SUBAREA 1)	35.6	0.056
RESERVOIR SURFACE (SUBAREA 2) @ NORMAL POOL EL 727.5	2.5	0.004
TOTAL	38.1	0.060

Form CTM-405A

C. T. MALE ASSOCIATES, P.C.
3000 TROY ROAD, SCHENECTADY, N.Y. 12309
(518) 783-0976
PROFESSIONAL ENGINEERS LAND SURVEYORS LAND PLANNING CONSULTANTS
COMPUTER SERVICES LANDSCAPE ARCHITECTURE LABORATORY SERVICES

JOB ILION RESERVOIR #1 DAM
SHEET NO. ____ OF ____
CALCULATED BY ELV DATE 6/23/81
CHECKED BY GTB DATE 8/12/81
SCALE 80.00847

DRAINAGE AREA DATA FOR HEC-1 DB MODEL

SUBAREA 1: AREA TRIBUTARY DIRECTLY TO RESERVOIR
AREA = 0.056 SQUARE MILES.

LOSS RATES: 1.0" - INITIALLY
0.1"/HOUR - CONSTANT LOSS RATE

UNIT HYDROGRAPH PARAMETERS: USE SNYDER METHOD

A = DRAINAGE AREA = 0.056 SQUARE MILES
L = LENGTH OF MAIN WATERCOURSE TO UPSTREAM LIMIT OF DRAINAGE AREA = 0.31 MILES
L_{CA} = LENGTH ALONG MAIN WATERCOURSE TO POINT OPPOSITE THE CENTROID OF THE DRAINAGE AREA = 0.11 MILES
C_t = SNYDER'S BASIN COEFFICIENT = 2.0 ASSUMED AVERAGE
C_p = SNYDER'S PEAKING COEFFICIENT = .625 ASSUMED AVERAGE
t_p = STANDARD LAG IN HOURS = $C_t(LL_{CA})^{0.3}$ = 0.73 HOURS

∴ USE t_p = 0.7 HOURS

SUBAREA 2: RESERVOIR SURFACE, AREA = 0.004 SQ. MILES = 2.5 ACRES

LOSS RATES: NONE BECAUSE RAINFALL ≈ RUNOFF FOR WATER SURFACE

UNIT HYDROGRAPH PARAMETERS:

FOR U.H. W/ 10 MINUTE DURATION + 1" RAIN

$$\bar{Q} = \frac{A(1")}{t} = \frac{2.5 \text{ acres } (1")}{10 \text{ minutes}} \left(\frac{43{,}560 \text{ sq FT}}{1 \text{ acre}}\right)\left(\frac{1 \text{ FT}}{12 \text{ inches}}\right)\left(\frac{1 \text{ minute}}{60 \text{ seconds}}\right)$$

$\bar{Q}$ = 15 cfs (W/O LOSS RATE)

C. T. MALE ASSOCIATES, P. C.
ENGINEERS SURVEYORS ARCHITECTS
LANDSCAPE ARCHITECTS PLANNERS
3000 TROY ROAD, SCHENECTADY, N.Y. 12309
(518) 785-0976

JOB ILION RESERVOIR #1 DAM
SHEET NO. _____ OF _____
CALCULATED BY ELV DATE 6/22/81
CHECKED BY GPB DATE 8/12/81
SCALE 80.00847

DISCHARGE COMPUTATIONS

SPILLWAY CAPACITY

SPILLWAY CONSISTS OF : 5' WIDE x 1' HIGH ORIFICE OPENING ON U/S END OF STEEP CULVERT PIPE, SIZE UNKNOWN.

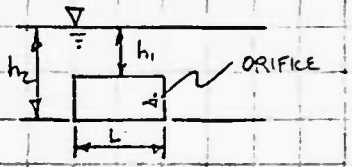
FOR FLOW $0' \leq 1'$ DEEP, WEIR FLOW ASSUMED :

$$Q = 3.33\,(L - 0.2H)\,H^{1.5}$$ (REFERENCE 8)

W/ L = length, 0.2H = end losses + SHARP-CRESTED RECTANGULAR WEIR
$K_a \approx 0.1$

FOR FLOW $> 1'$, ORIFICE FLOW ASSUMED:

$$Q = \frac{2}{3} L C \sqrt{2g}\,(h_2^{3/2} - h_1^{3/2})$$ (REFERENCE 8)



W/ C = ORIFICE COEF. = 0.6

	ELEV. (NGVD)	$H + h_2$ WATER DEPTH (feet)	Q_{WEIR} (cfs)	$Q_{ORIFICE}$ (cfs)	$Q_{SPILLWAY}$ (cfs)
SPILLWAY CREST	728.5	0	0		0
	729	.5	6		6
	729.5	1.0	16	16	16
	730	1.5	29	24	24
	731	2.5		34	34
TOP OF DAM	732	3.5		42	42
	733	4.5		48	48

C. T. MALE ASSOCIATES, P.C.
ENGINEERS SURVEYORS ARCHITECTS
LANDSCAPE ARCHITECTS PLANNERS
3000 TROY ROAD, SCHENECTADY, N.Y. 12309
(518) 785-0976

JOB ILION RESERVOIR #1 DAM
SHEET NO. _____ OF _____
CALCULATED BY ELV DATE 6/22/81
CHECKED BY [illegible] DATE 8/12/81
SCALE 80.00847

DISCHARGE COMPUTATIONS

DAM APPURTENANCE	ELEVATION (NGVD)	SIZE
CULVERT SPILLWAY (W/ ENTRANCE WEIR)	CREST EL = 728.5	5' CREST LENGTH
DAM	TOP OF DAM EL = 732	270' CREST LENGTH
OUTLET PIPE	INLET INVERT EL = 700	16" CIP
BLOWOFF PIPE	INLET INVERT EL = 693	16" CIP

FOR FLOW OVER DAM: $Q = \underbrace{3.087}_{\text{INPUT}} L H^{1.5}$ (FORMULA FOR CRITICAL FLOW OVER BROAD-CRESTED WEIR, REF. 9)

	ELEVATION (NGVD)	$H_{SPILLWAY}$ (ft.)	H_{DAM} (ft.)	Q_{OUTLET} (cfs)	$Q_{BLOWOFF}$ (cfs)	INPUT $Q_{SPILLWAY}$ (cfs)	Q_{DAM} (cfs)	Q_{TOTAL} (cfs)
NORMAL POOL	727.5	0	0	0	0	0	0	0
SPILLWAY CREST	728.5	0	0	ASSUMED CLOSED	ASSUMED CLOSED	0	0	0
	729	.5	0			6	0	6
	729.5	1.0	0			16	0	16
	730	1.5	0			24	0	24
	731	2.5	0			34	0	34
TOP OF DAM	732	3.5	0			42	0	42
	733	4.5	1	0	0	48	833	881

```
A NYD DAM INSPECTION: DACW51-81-C-0014
A NY00185 ILION RESERVOIR NO. 1 DAM, 80.00847
A OVERTOPPING ANALYSIS IRIU1
B   288        C        10                                          4
B1    5
J     1        2        1
J1   1.0      0.5
K     0     SA-1                                      1
K1 SUBAREA 1 RUNOFF COMPUTATION
M     1        1    0.056                10                         1
P             19.2     111      123      132      142
T                                                    1.0      .10
U    0.7     .625
X     -2        0        1
K     0     SA-2                                      1
K1 SUBAREA 2 (RESERVOIR) RUNOFF COMPUTATION
M     1       -1    0.009                10                         1
P             19.2     111      123      132      142
T                                                    0        0
U     1
U1   15
X     -2        0        1
K     2     SA-2C                                     1
K1 COMBINING HYDROGRAPHS 1 & 2
K     1     RES                        2              1
K1 ROUTING FLOW THROUGH RESERVOIR
Y                                      1              1
Y1    1                                                -727.5       -1
Y4 727.5    728.5      729    729.5      730      731      732      733
Y5    2        0        6       16       29       34       42       48
S5    1       46       93
SE  693    727.5      740
S4 728.5
SO  732    3.087      1.5      270
K    99
A
A
A
A
A
```

```
**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
  LAST MODIFICATION  26 FEB 79
**********

RUN  DATE: 8/19/81
     TIME:11:31 AM

                    NYD DAM INSPECTION: DACW51-81-C-0014
                    NYC0185 ILION RESERVOIR NO. 1 DAM, 80.00847
                    OVERTOPPING ANALYSIS IRI01

                                        JOB SPECIFICATION
                      NO      NHR     NMIN     IDAY      IHR     IMIN   METRC     IPLT     IPRT    NSTAN
                     288       0       10        0        0        0       0        0        4        0
                                        JOPER      NW     LROPT    TRACE
                                            5       0         0        0

                                        MULTI-PLAN ANALYSES TO BE PERFORMED
                                          NPLAN= 1 NRTIO= 2 LRTIO= 1
                                RTIOS=   1.00   0.50

**********      **********      **********      **********      **********

                                        SUB-AREA RUNOFF COMPUTATION

                    SUBAREA 1 RUNOFF COMPUTATION
                                      ISTAG    ICOMP    IECON    ITAPE    JPLT     JPRT    INAME  ISTAGE    IAUTO
                                       SA-1        0        0        0       0        0        1       0        0

                                        HYDROGRAPH DATA
                                IHYDG    IUHG   TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
                                    1       1    0.06    0.00   10.00    0.00   0.000       0       1       0

                                        PRECIP DATA
                                  SPFE     PMS      R6     R12     R24     R48     R72     R96
                                  0.00   19.20  111.00  123.00  132.00  142.00    0.00    0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.600

                                        LOSS DATA
                          LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
                              0    0.00    0.00    1.00    0.00    0.00    1.00    1.00    0.10    0.00    0.00

                                        UNIT HYDROGRAPH DATA
                                    TP=  0.70    CP=0.63    NTA=  0

                                        RECESSION DATA
                                  STRTQ=   -2.00    QRCSN=    0.00    RTIOR= 1.00

                    UNIT HYDROGRAPH 23 END-OF-PERIOD ORDINATES, LAG=    0.70 HOURS, CP= 0.62  VOL= 1.00
                      3.      11.      22.      30.      32.      28.      21.      15.      12.      10.
                      7.       6.       4.       3.       3.       2.       2.       1.       1.       1.
                      1.       0.       0.

                    0                                   END-OF-PERIOD FLOW
                  MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q       MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                                SUM  21.81  18.16   3.65     3921.
                                                                                     (554.1) (461.1)  93.1)  111.0)
```

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

SUBAREA 2 (RESERVOIR) RUNOFF COMPUTATION

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
SA-2	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	0.00	0.00	10.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	19.20	111.00	123.00	132.00	142.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.800

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00

RECESSION DATA

STRTQ= -2.00 QRCSN= 0.00 RTIOR= 1.00

0

END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
									SUM	21.81	21.31	0.00	298.
										(554.)(554.)(0.)(8.44)			

********** ********** ********** ********** **********

COMBINE HYDROGRAPHS

COMBINING HYDROGRAPHS 1 & 2

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
SA-2C	2	0	0	0	0	1	0	0

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

ROUTING FLOW THROUGH RESERVOIR

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
RES	1	0	0	2	0	1	0	0

ROUTING DATA

GLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-726.	-1

STAGE	727.50	728.50	729.00	729.50	730.00	731.00	732.00	733.00
FLOW	0.00	0.00	6.00	16.00	24.00	34.00	42.00	48.00
CAPACITY=	0.	46.	93.					
ELEVATION=	693.	726.	740.					

CREL	SPWID	COOW	EXPW	ELLVL	COOL	CAREA	EXPL
728.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COOD	EXPD	DAMWID
732.0	3.1	1.5	270.

PEAK OUTFLOW IS 209. AT TIME 40.33 HOURS

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

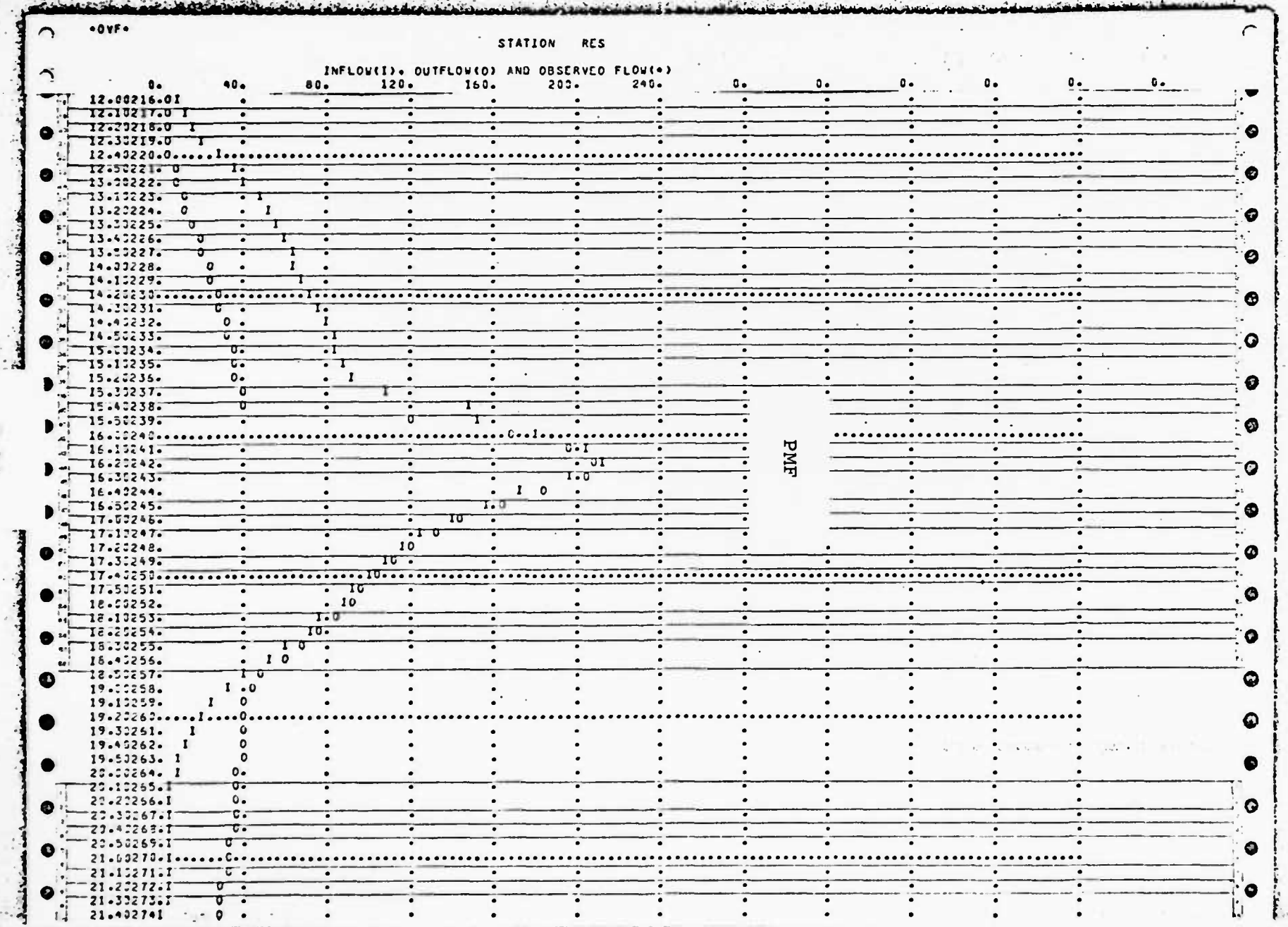
OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS RATIO 1 1.00	 RATIO 2 0.50
HYDROGRAPH AT	SA-1	0.06 (0.15)	1	205. (5.81)	103. (2.91)
HYDROGRAPH AT	SA-2	0.00 (0.01)	1	44. (1.24)	22. (0.62)
2 COMBINED	SA-2C	0.06 (0.16)	1	211. (5.98)	106. (2.99)
ROUTED TO	RES	0.06 (0.16)	1	209. (5.93)	91. (1.17)

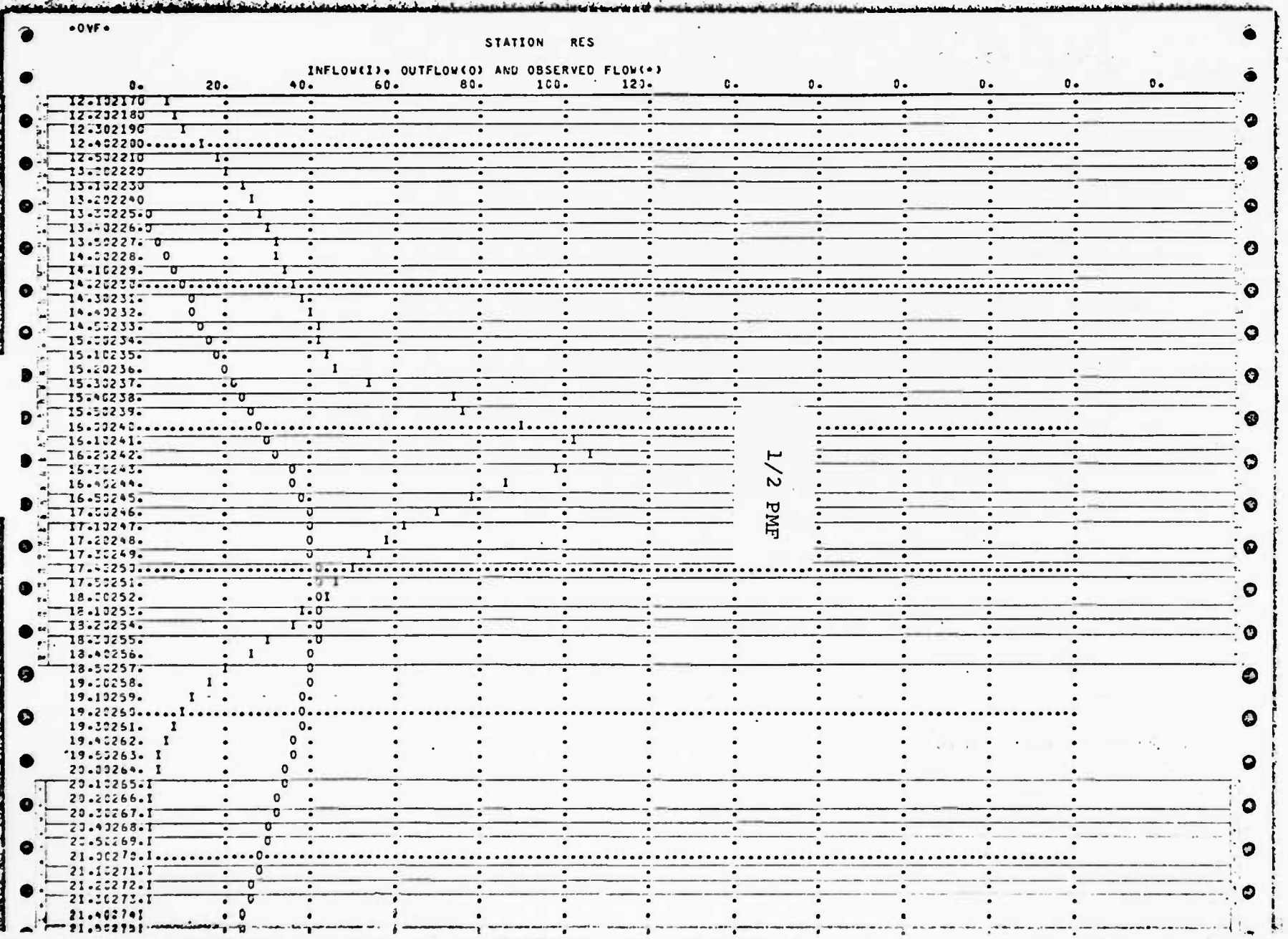
SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	727.50	728.50	732.00
STORAGE	46.	50.	63.
OUTFLOW	0.	0.	42.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	732.34	0.34	64.	209.	3.33	40.33	0.00
0.50	731.93	0.00	63.	41.	0.00	42.00	0.00


•OVF•
STATION RES
INFLOW(I)• OUTFLOW(O) AND OBSERVED FLOW(•)
0. 40. 80. 120. 160. 200. 240.
PMF


•OVF•
STATION RES
INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(•)
0. 20. 40. 60. 80. 100. 120. 0. 0. 0. 0. 0. 0.
1/2 PMF

APPENDIX D

STABILITY ANALYSIS

NO GRAVITY STRUCTURES TO ANALYZE

APPENDIX E

REFERENCES

REFERENCES

This is a general list of references pertinent to dam safety investigations. Not all references listed have necessarily been used in this specific report.

1. "Engineering and Design, National Program For Inspection of Non-Federal Dams", ER 1110-2-106, Dept. of the Army, Office of the Chief of Engineers, 26 September 1979, with Change 1 of 24 March 1980. Included as Appendix D of the ER is "Recommended Guidelines For Safety Inspection of Dams".

2. "HEC-1 Flood Hydrograph Package, Users Manual", The Hydrologic Engineering Center, U.S. Army Corps of Engineers, January 1973.

3. "Flood Hydrograph Package (HEC-1), Users Manual for Dam Safety Investigations", The Hydrologic Engineering Center, U.S. Army Corps of Engineers, September 1978.

4. HMR 33, "Seasonal Variations of Probable Maximum Precipitation, East of the 105th Meridian for Areas 10 to 1000 Square Miles and Durations from 6 to 48 Hours," U.S. Dept. of Commerce, NOAA, National Weather Service, 1956.

5. HMR 51, "All-Season Probable Maximum Precipitation, U.S. East of 105th Meridian for Areas from 1000 to 20,000 Square Miles and Durations from 6 to 72 Hours", U.S. Dept. of Commerce, NOAA, National Weather Service, 1974.

6. HYDRO-35, "Five-to-60 Minute Precipitation Frequency for the Eastern and Central United States", U.S. Dept. of Commerce, NOAA, National Weather Service, June 1977.

7. "Technical Paper No. 40, Rainfall Frequency Atlas of the United States", U.S. Dept. of Commerce, Weather Bureau, 1961.

8. Design of Small Dams, United States Dept. of the Interior, Bureau of Reclamation, Second Edition, 1973, Revised Reprint, 1977.

9. King, Horace W. and Brater, Ernest F., Handbook of Hydraulics, fifth edition, McGraw-Hill Book Co., Inc., New York, N. Y., 1963.

10. "Flood Hydrograph Analyses and Computations", EM 1110-2-1405, U.S. Army Corps of Engineers, 31 August 1959.

11. "Technical Release No. 55, Urban Hydrology for Small Watersheds", U.S. Dept. of Agriculture, Soil Conservation Service (Engineering Division), January 1975.

12. National Engineering Handbook, Section 4, Hydrology, U. S. Dept. of Agriculture, Soil Conservation Service, August 1972.

13. "Hydraulic Design of Spillways", EM 1110-2-1603, U.S. Army Corps of Engineers, 31 March 1965, with Change 1 included.

14. "Standard Project Flood Determinations", EM 1110-2-1411, U.S. Army Corps of Engineers, 26 March 1952.

15. "Hydrologic and Hydraulic Assessment", Appendix D of EC 1110-2-188, U.S. Army Corps of Engineers, 30 December 1977.

16. "Reviews of Spillway Adequacy, National Program of Inspection of Non-Federal Dams", ETL 1110-2-234, U.S. Army Corps of Engineers, 10 May 1978.

17. Hammer, Mark J., Water and Waste-Water Technology, John Wiley & Sons, Inc., New York, 1975.

18. "Hydraulic Charts For the Selection of Highway Culverts", Hydraulic Engineering Circular No. 5, U.S. Department of Commerce, Bureau of Public Roads, December 1965.

19. "Guide for Making a Condition Survey of Concrete in Service", American Concrete Institute (ACI) Journal, Proceedings Vol. 65, No. 11, November 1968, pages 905-918.

20. "Upper Hudson & Mohawk River Basins, Hydrologic Flood Routing Models", New York District, Corps of Engineers, October 1976.

21. "Climatological Data, Annual Summary, New York, 1979", Volume 91, No. 13, National Oceanic and Atmospheric Administration, Asheville, North Carolina.

22. "Climatological Data, New York, September 1980", Volume 92, No. 9, National Oceanic and Atmospheric Administration, Asheville, North Carolina.

23. "Water Resources Data For New York, Water Year 1979", Volume 1, USGS Water-Data Report NY-79-1, U.S. Geological Survey, Albany, New York, 1980.

24. "Maximum Known Stages and Discharges of New York Streams Through 1973", Bulletin 72, U.S. Geological Survey, 1976.

25. "Characteristics of New York Lakes (Gazetteer)", Bulletin 68, U.S. Geological Survey and NYS Department of Environmental Conservation, 1970.

26. "Geologic Map of New York", Hudson-Mohawk Sheet, New York State Museum and Science Service, University of the State of N.Y., State Education Dept., Albany, N.Y., reprinted 1973.

27. "Landforms and Bedrock Geology of New York State", New York State Museum and Science Service, University of the State of N.Y., State Education Dept., Albany, N.Y., reprinted 1973.

APPENDIX F

AVAILABLE ENGINEERING DATA AND RECORDS

TABLE OF CONTENTS

APPENDIX F

SECTION F1

LOCATION OF AVAILABLE ENGINEERING DATA AND RECORDS

1. Owner: Village of Ilion Board of Water Commissioners
   P.O. Box 330
   Morgan Street
   Ilion, NY 13357
   Attn: Charles R. Baker, Water Superintendent
   (315) 895-7711

   Available: Background data, drawings.

2. Designer: Stanwix Engineering Co. (no longer in business).

3. Construction Contractor: J. J. Rumsey, Fostoria, Ohio
   (business status unknown)

4. Agency: NYS Department of Environmental Conservation
   50 Wolf Road
   Albany, NY 12233
   Attn: George Koch, P.E., Chief, Dam Safety Section
   (518) 457-5557

   Available: Inspection report.

4585

PHASE I INSPECTION

CHECKLIST FOR GENERAL ENGINEERING DATA
& INTERVIEW WITH DAM OWNER

Name of Dam ILION RESERVOIR NO. 1 DAM Fed. Id.# NY00186

Date 1/29/81 6/4/81 Interviewer(s) EDWIN VOPELAK JR. THOMAS BENNEDUM

Dam Owner/Representative(s) Interviewed, Title & Phone#
CHARLES R. BAKER, WATER SUPERINTENDANT (315) 895-7711
EDWARD C. ALLSTON, ASS'T WATER SUPERINTENDANT (315) 895-7711
MICHAEL McCORMACK, FILTER PLANT OPERATOR (315) 894-9144

1. OWNERSHIP (name, title, address & phone #) VILLAGE OF ILION
BOARD OF WATER COMMISSIONERS, MORGAN ST., P.O. BOX 330,
ILION, NY 13357, (315) 895-7711

2. OPERATOR (name, title, address & phone # of person responsible for day-to-day operation) CHARLES R. BAKER, WATER SUPERINTENDANT
OFFICE - (SAME ADDRESS + PHONE AS OWNER)
HOME - 157 PROSPECT ST., ILION, NY 13357 (315) 894-2348
MICHAEL McCORMACK, FILTER PLANT OPERATOR (315) 894-9144

a. Operator Full/Part time FILTER PLANT OPPERATOR + SUPT. ARE FULL TIME EMPLOYEES.

3. PURPOSE OF DAM

a. Past CREATE IMPOUNDMENT FOR RAW WATER STORAGE

b. Present (SAME AS ABOVE)
RESERVOIR WATER IS PRECHLORINATED + AERATED

4. DESIGN DATA

a. Designed When 1891 & 1892

b. By (name, address, phone #, business status)
STANWIX ENGINEERING CO., ROME, NY
(NO LONGER IN BUSINESS)

c. Geology Reports NONE KNOWN

d. Subsurface Investigations NONE KNOWN

e. Design Reports/Computations (H&H, stability, seepage)
NONE KNOWN

f. Design Drawings (plans, sections, details) YES - SEE APPENDICES G-1 TO G-8

g. Design Specifications NONE KNOWN.

h. Other HISTORY OF WATER SYTEM (SEE APPENDICES F3-4 TO F3-10) + GENERAL DATA ON DAM (SEE APPENDIX F3-10). BOTH FROM OWNER.

5. CONSTRUCTION HISTORY

a. Initial Construction

1) Completed When 1892-1893

2) By (name, address, phone #, business status) MR. V.J. RUMSEY . FOSTORIA, OHIO (BUSINESS STATUS UNKNOWN)

3) Borrow Sources/Material Tests NONE KNOWN.

4) Construction Reports/Photos NONE KNOWN.

5) Diversion Scheme/Construction Sequence NONE KNOWN.

6) Construction Problems NONE KNOWN.

7) As-Built Drawings (plans, sections, details) NONE KNOWN.

8) Data on Electrical & Mechanical Equipment Affecting Safe Operation of Dam N/A (ELECTRIC @ FILTER PLANT)

9) Other N/A

4576

b. Modifications (review design data & initial construction items as applicable & describe)

NONE KNOWN.

c. Repairs & Maintenance (review design data & initial construction items as applicable & describe)

NONE KNOWN.

6. OPERATION RECORD

a. Past Inspections (dates, by, authority, results)

NYS-DEC INSPECTION - OCT. 19, 1971 (SEE APPENDIX F3-30)

b. Performance Observations (seepage, erosion, settlement, post-construction surveys, instrumentation & monitoring records) NONE

c. Post-Construction Engineering Studies/Reports

1961, 1964 STUDY OF WATER SYSTEM BY STEARNS & WHELER, BUT DID NOT INCLUDE STUDY OF DAM.

d. Routine Rainfall, Reservoir Levels & Discharges

- FILTER PLANT OPERATOR CHECK LEVEL SEVERAL TIMES DAILY & RECORDS LEVEL IN DAILY LOG. MANY YEARS OF RECORD.
- APR. 1 - NOV. 1 - RAINFALL AT RES #1, NEAR WATER TREATMENT PLANT, MEASURED BY PLANT OPERATOR. RECORDS FROM 1948 TO PRESENT.

4564

e. Past Floods That Threatened Safety (when, cause, discharge, max. pool elevation, any damage) NONE.

OVERFLOW SPILLWAY USED EVERY SPRING UNDER CONTROLLED CONDITIONS TO SKIM OFF RESERVOIR SURFACE, MAX FLOW ABOUT 1" OVER CREST.

f. Previous Failures (when, cause, describe) NONE.

g. Earthquake History (seismic activity in vicinity of dam)

NONE KNOWN.

7. VALIDITY OF DESIGN, CONSTRUCTION & OPERATION RECORDS (note any apparent inconsistencies)

ELEVATION OF TOP OF DAM IS ABOUT 1/2 A FOOT HIGHER THAN THE ELEVATION FOR TOP OF DAM ON APPENDIX G-4.

8. OPERATION & MAINTENANCE PROCEDURES

a. Operation Procedures in writing? NO. Obtain copy or describe. (reservoir regulation plan, normal pool elevation and status of operating facilities, who operates & means of communication to controller, mode of operating facilities, i.e., manual, automatic, remote)

- FEED LINE TO RESERVOIR CONSISTS OF 10" OUTLET PIPE FROM RES #2 WHICH CONNECTS W/ 8" PIPE FROM RES #3. BESIDES VALVES ON PIPE AT RES #2 THERE ARE 3 VALVES IN SERIES ON LINE NEAR RES #1 WHICH CAN BE OPERATED TO CONTROL FLOW INTO RES #1
- VALVE ON OUTLET PIPE FROM RES #1 EXERCISED AT LEAST ONE A MONTH (VALVE IN VAULT). VALVE ON OUTLET PIPE W/ VALVE BOX IS HARD TO OPERATE, CANNOT CLOSE FULLY, IS OPERATED EVERY 2 OR 3 YEARS.
- NORMALLY WATER SURFACE KEPT 1' OR MORE BELOW SPILLWAY CREST.

b. Maintenance Procedures in writing? NO Obtain copy or describe.

- MOW CREST, DIKE & AROUND RESERVOIR REGULARLY
- KEEP RIPRAP CLEAR OF BRUSH
- DURING ICE FORMING WEATHER, DRAIN RESERVOIR DOWN BY OPENING BLOWOFF &/OR PLUGGING INTAKES. DRAW DOWN ABOUT 1' TO PREVENT RIPRAP DAMAGE, RESEVOIR REFILLED IN SPRING
- BLOWOFF USED WEEKLY TO CONTROL SEDIMENT BUILD-UP IN RESERVOIR

2425

c. Emergency Action Plan & Warning System in Writing? NO
Obtain copy or describe. (actions to be taken to minimize the D/S effects of an emergency)

WOULD UTILIZE WATER DEPT. PERSONNEL TO CONTACT IN HAZARD AREA BY GOING DOOR TO DOOR.

9. OTHER

APPENDIX F

SECTION F3

COPIES OF ENGINEERING DATA AND RECORDS

TABLE OF CONTENTS

DAM INSPECTION REPORT RESIVOR #1

03	22		6901B	10/19/71	003	1
NS	CTY	YR AP.	DAM NO.	INS. DATE	USE	TYPE

AS BUILT INFORMATION

- [ ] Location of Sp'way and outlet
- [ ] Elevations
- [ ] Size of Sp'way and Outlet
- [ ] Geometry of Non-overflow section

[1] GENERAL CONDITION OF NON-OVERFLOW SECTION

[1] Settlement	[1] Cracks	[1] Deflections
[1] Joints	[0] Surface of Concrete	[1] Leakage
[1] Undermining	[1] Settlement of Embankment	[1] Crest of Dam
[2] Downstream Slope TREES	[1] Upstream Slope	[1] Toe of Slope

[1] GENERAL COND. OF SP'WAY AND OUTLET WORKS

[4] Auxiliary Spillway	[4] Service or Concrete Sp'way	[1] Stilling Basin
[1] Joints	[4] Surface of Concrete	[1] Spillway Toe
[2] Mechanical Equipment	[1] Plunge Pool	[1] Drain

[1] Maintenance	[A] Hazard Class
[3] Evaluation	[ ] [4] Inspector

COMMENTS:

ILION WATER WORKS

DEC DAM INSPECTION REPORT CODING

1. River Basin - Nos. 1-23 on Compilation Sheets
2. County - Nos. 1-62 Alphabetically
3. Year Approved -
4. Inspection Date - Month, Day, Year
5. Apparent use -
   1. Fish & Wildlife Management
   2. Recreation
   3. Water Supply
   4. Power
   5. Farm
   6. No Apparent Use
6. Type -
   1. Earth with Aux. Service Spillway
   2. Earth with Single Conc. Spillway
   3. Earth with Single non-conc. Spillway
   4. Concrete
   5. Other
7. As-Built Inspection - Built substantially according to approved plans and specifications

Location of Spillway and Outlet Works

1. Appears to meet originally approved plans and specifications.
2. Not built according to plans and specifications and location appears to be detrimental to structure.
3. Not built according to plans and specifications but location does not appear to be detrimental to structure.

Elevations

1. Generally in accordance to approved plans and specifications as determined from visual inspection and use of hand level.
2. Not built according to plans and specifications and elevation changes appear to be detrimental to structure.
3. Not built according to plans and specifications but elevation changes do not appear to be detrimental to structure.

Size of Spillway and Outlet Works

1. Appears to meet originally approved plans and specifications as determined by field measurements using tape measure.
2. Not built according to plans and specifications and changes appear detrimental to structure.
3. Not built according to plans and specifications but changes do not appear detrimental to structure.

Geometry of Non-overflow Structures

1. Generally in accordance to originally approved plans and specifications as determined from visual inspection and use of hand level and tape measure.
2. Not built according to plans and specifications and changes appear detrimental to structure.
3. Not built according to plans and specifications but changes do not appear detrimental to structure.

General Conditions of Non-Overflow Section

1. Adequate - No apparent repairs needed or minor repairs which can be covered by periodic maintenance.
2. Inadequate - Items in need of major repair.

(items) For boxes listed on condition under non-overflow section.

1. Satisfactory.
2. Can be covered by periodic maintenance.
3. Unsatisfactory - Above and beyond normal maintenance.

DEC DAM INSPECTION REPORT CODING (cont.)

General Condition of Spillway and Outlet Works

1. Adequate - No apparent repairs needed or minor repairs which can be covered by periodic maintenance.
2. Inadequate - Items in need of major repair.

(Items) For boxes listed conditions listed under spillway and outlet works.

1. Satisfactory.
2. Can be covered by periodic maintenance.
3. Unsatisfactory - Above and beyond normal maintenance.
4. Dam does not contain this feature.

Maintenance

1. Evidence of periodic maintenance being performed.
2. No evidence of periodic maintenance.
3. No longer a dam or dam no longer in use.

.S.)

Hazard Classification Downstream

1. (A) Damage to agriculture and county roads.
2. (B) Damage to private and/or public property.
3. (C) Loss of life and/or property.

Evaluation - Based on Judgment and Classification in Box Nos.

Evaluation for Unsafe Dam

1. Unsafe - Repairable.
2. Unsafe - Not Repairable.
3. Insufficient evidence to declare unsafe.

River Basins	Counties	
(1) LOWER HUDSON	1 Albany	36 Orange
(2) UPPER HUDSON	2 Allegany	37 Orleans
(3) MOHAWK	3 Bronx	38 Oswego
(4) LAKE CHAMPLAIN	4 Broome	39 Otsego
(5) DELAWARE	5 Cattaraugus	40 Putnam
(6) SUSQUEHANNA	6 Cayuga	41 Queens
(7) CHEMUNG	7 Chautauqua	42 Rensselaer
(8) OSWEGO	8 Chemung	43 Richmond
(9) GENESEE	9 Chenango	44 Rockland
(10) ALLEGHENY	10 Clinton	45 St. Lawrence
(11) LAKE ERIE	11 Columbia	46 Saratoga
(12) WESTERN LAKE ONTARIO	12 Cortland	47 Schenectady
(13) CENTRAL LAKE ONTARIO	13 Delaware	48 Schoharie
(14) EASTERN LAKE ONTARIO	14 Dutchess	49 Schuyler
(15) SALMON RIVER	15 Erie	50 Seneca
(16) BLACK RIVER	16 Essex	51 Steuben
(17) WEST ST. LAWRENCE	17 Franklin	52 Suffolk
(18) EAST ST. LAWRENCE	18 Fulton	53 Sullivan
(19) RACQUETTE RIVER	19 Genesee	54 Tioga
(20) ST. REGIS RIVER	20 Greene	55 Tompkins
(21) HOUSATONIC	21 Hamilton	56 Ulster
(22) LONG ISLAND	22 Herkimer	57 Warren
(23) OSWEGATCHIE	23 Jefferson	58 Washington
(24) GLASSE	24 Kings	59 Wayne
	25 Lewis	60 Westchester
	26 Livingston	61 Wyoming
	27 Madison	62 Yates
	28 Monroe	
	29 Montgomery	
	30 Nassau	
	31 New York	
	32 Niagara	
	33 Oneida	
	34 Onondaga	
	35 Ontario	

Board of Water Commissioners

MUNICIPAL BUILDING
ILION, NEW YORK 13357

The first Board of Water Commissioners of the Village of Ilion, was elected at a special election, held February 21, 1891, called for this purpose by trustees of the Village, in compliance with a petition signed by a majority of the taxpayers. After their election, these men were assigned the tremendous task of determining the source of supply, the kind of works to be constructed and deciding upon its location and superintending its construction. Their operating capital was $1,000.

It was first thought that a pumping system from deep wells, would be the most practical, but after several experiments with wells in the community, it was demonstrated that the quantity of water that these wells would furnish would be so small in comparison to the quantity required and the total number of wells would be so great, as to make it extremely impractical.

The Water Board then turned their attention to the flowing springs in various locations outside the Village. The yield from these springs proved to exceed the maximum quantity, as set. The locations of these sources, or springs, were so geographically wide spread, that again their use was extremely impractical.

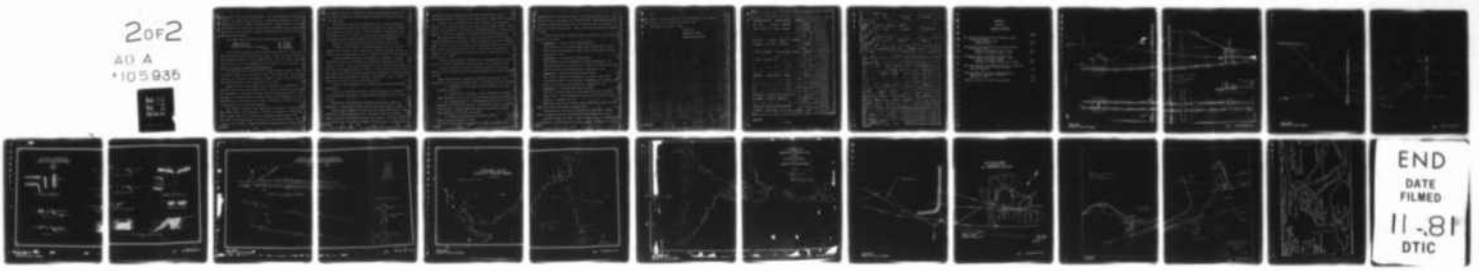
At the September 4, 1891 special Water Board meeting, the following motion was made: " The secretary was instructed to write to the Stanwix Engineering Co., of Rome, N. Y., in regard to having their Mr. Knight come and look over the surrounding country and advise us in regard to the possible sources of water supply".

At the October 15, 1891 meeting, the written report from Mr. Knight was presented to the Water Board. This report was the beginning of the

OWNER

AD-A105 935 MALE (C T) ASSOCIATES SCHENECTADY NY F/G 13/13
NATIONAL DAM INSPECTION PROGRAM. ILION RESERVOIR NUMBER 1 DAM (--ETC(U)
SEP 81 K J MALE DACW51-81-C-0014
UNCLASSIFIED NL

2 OF 2
AD A
105935



END
DATE FILMED
11-81
DTIC


A
593

Village of Ilions' Public Water Supply. The report called for a gravity system. The supply, was an intake on a stream being brought to an impounding reservoir of about 15 million gallons. Water from this reservoir to pass thru two (2) open slow sand filters of 300,000 gallons each, perday. The filtered water to go to a covered distributing basin (clear well) of 900,000 gallon capacity.

The engineering cost estimates for the original system are;

Supply System	$ 32,960.
Filtering System	$ 16,000.
Distribution System (piping)	$ 44,300.
Total	$ 93,260.

At a special meeting of the Water Board, held March 20, 1892, bids for the above mentioned projects, were opened. There were three bidders, with a high of $99,470. to a low of $72,326.97; This low bid was disqualified and the next low bid of $76,851.67 was accepted. The successful bidder was a Mr. J. J. Rumsey of Fostoria, Ohio

In 1893, the first reservoir of 15 million gallon capacity, being fed thru an intake from a spring fed stream, was constructed. The chosen point for the reservoir was a gully on a ridge of land, about two miles south of the Village, with an elevation of 732 feet.

About 800 feet to the north of said reservoir, at an elevation of 676 feet, two (2) slow sand filters with an area of 3,040 square feet each, were constructed. Our records indicate that these slow sand filters were the third to be constructed in the United States, with Poughkeepsie, N. Y. and Hudson, N. Y. being first and second. The filters in Ilion are still in operation and are being used everyday.

The effluent from these slow sand filters was piped to a below ground clear water basin. This clearwell is 103 feet in diameter, 14 feet deep, with a ground cover of 1 1/2 feet on a reinforced concrete dome. The side walls and support columns are of poured, reinforced concrete. The capacity of this basin is 900,000 gallons and the elevation of this clear-

OWNER

well-full-is 667 feet. This point, having an elevation of about 265 feet above our Main St., assured ample pressure by gravity, to every street in town.

The filtered water left the clearwell by a 16 inch transmission main to the newely constructed distribution system, on which customers were lined up to sign for taps to their property. Unfortunately, the sewer board had not been able to keep pace, so many applicants had to be denied the water service until the sewer had been installed.

This was the beginning of the Village of Ilion water works.

I would be very remiss as a proud department head, if I did not continue this article to the present time. Without too many details, I shall try, in chronological order, to update our system to the present.

As the population increased and industries expanded, it became necessary to increase the storage and filtration capacity to meet the demand. In 1902 - 1903, a new impounding reservoir (65 million gallons), fed by a second stream intake, was built. At the same time, two covered slow sands with 3,948 square feet each, were constructed. These filters more than doubled the original capacity. The control valves on these filters were located in the original gate house.

1913, saw the installation of a venturi meter on the distribution supply main.

In 1915, an additional intake on another stream was constructed and a transmission main laid to supply additional water to the reservoir of 1903.

In the year 1916, the use of chlorine in the water system was instituted. According to records, this process caused quite a storm.

1917 saw the addition of two more covered slow sand filters. These filters were 5,550 square feet each. The area of these two filters almost doubled the area of the existing four filters. The total filter area at this time, was about six tenths (.6) of an acre. In recent years,

one of these larger filters has been taken out of service, due to structural failure. The present area being used is about .45% of an acre.

In 1922, work was commenced on a new reservoir, with associated piping, to the east and south of the Village, in a natural ravine. This project was completed in 1923 with an impounding capacity of 165 million gallons. The total impounding capacity was now 245 million gallons.

The Ilion Water Department, in 1938 joined with The Federal Works Progress Administration program, in the construction of a water softener plant. The W. P. A. was to construct the building at their cost and the Water Board, supply the softening units. These units being three in number-Permutit Manufacturer, using zeolite resin. This plant put in service June 3, 1939.

In 1947, a new building, designated as a chlorine house, was built to house additional chlorinators for the purpose of pre-chlorination.

A complete survey and study of all Water Department facilities was made by the consulting firm of Stearns & Wheler and Pitometer Associates in 1960.

This survey led into a project of intensive renovation of and addition to, our existing treatment plant. This project lists as follows:

1. Replacing the softeners with high exchange resins and associated piping.

2. Constructing a building to house a Glenfield & Kennedy Micro-Strainer, 7feet 6", dia. and associated piping and laboratory.

3. Installing three (3) "diatomaceous earth filter units", complete with accessory equipment. These filter units are capable of producing 1 million gallons per day and are used to augment the production of our slow sand filters.

4. Complete new chlorine distribution system.

These projects completed in 1962.

In 1968, the Water Board decided it was time to eliminate the

antiquated flat rate billing system. It was decided to do this. The Village of Ilion would have to be metered 100%. The metering contract was awarded, with the Hersey Meter Co. being the successful bidder for meters and 100% remote readers. This project was successfully completed in 1969.

In the fall of 1970, contracts were bid on four (4) major projects. These are so listed:

Contract 1. - Steele's Creek Pumping Station

This involved (4) diverting intake dams bringing water to the pump station and pumping (if needed) into an existing reservoir. Completed in 1971

Contract 2. - Construction of Water Mains

This project was to strengthen our distribution system. The contractor installed 22,345 feet of 6 inch to 16 inch size, water pipe tied into the existing system. Completed in 1971

Contract 3. - Prestressed Concrete Water Tanks

Two concrete tanks were constructed on opposite ends of the distribution system. One tank has 2 million gallon capacity; the other a 0.5 million gallon capacity. Completed in 1971

Contract 4. - Old Forge Road Pumping Station

This was a booster station to push water into the 0.5 million gallon tank . The telemetering equipment was included in this contract. Completed in 1971

With these projects, our water system construction comes to rest until such time as we forsee a growing need.

I would like to say that the financing for the entire system, start to present, has come entirely from Water Department revenues.

Needless to say, the Board of Water Commissioners, its Superintendent and employees, are all proud of our water system. We adhere to the open

door policy - if ever in Ilion, N. Y. or vicinity, please stop and look us over. It is a fine way to spend a day.

On behalf of my Board, I say,

Thank you,

CHARLES R. BAKER

WATER SUPERINTENDENT

OWNER

WATERSHED DRAINAGE AREA

	Sq. M.
#1 RES., HAWK'S CREEK	
No. 2 INTAKE TO No. 1 INTAKE	0.48
#2 RES. - HAWK'S CREEK INTAKE	
SOURCE TO No. 2 INTAKE	4.02
No. 3 INTAKE LITCHFIELD CREEK	2.95 ~ 2.1 STE
NEW SOURCE OF	
#3 RES. WATERSHED AREA	1.0
STEELES CREEK WATERSHED ABOVE HAWK'S CREEK	21.60
STEELES CREEK WATERSHED ABOVE PROPOSED PUMPING STATION	17.1

OWNER

Height of Dam

#1 40' #2 60' #3 83'

Post Manual Mach. Cl2 1919

1924 - New Chlorinator

1948 Pre Chlorination introduced.

Usable depth in feet

#1 27.5 #2 45. #3 54'

Flow Line

#1 727.5 #916.0 941.0

INTAKES #2 Res. 891.0 ELEV.

RES

#1 FLOW LINE 727.5

16" Supply Line 700.0

Depth of Res.

SUPPLY LINE 871.0

LAND 319.64 ACRES

INUNDATED AREA LAKES, RES. ect. 90 ACRES

TOTAL DRAINAGE AREA 4,912

90% LAND FORESTED

1967 $4.70 TAXED PER ACRE OF LAND

1972

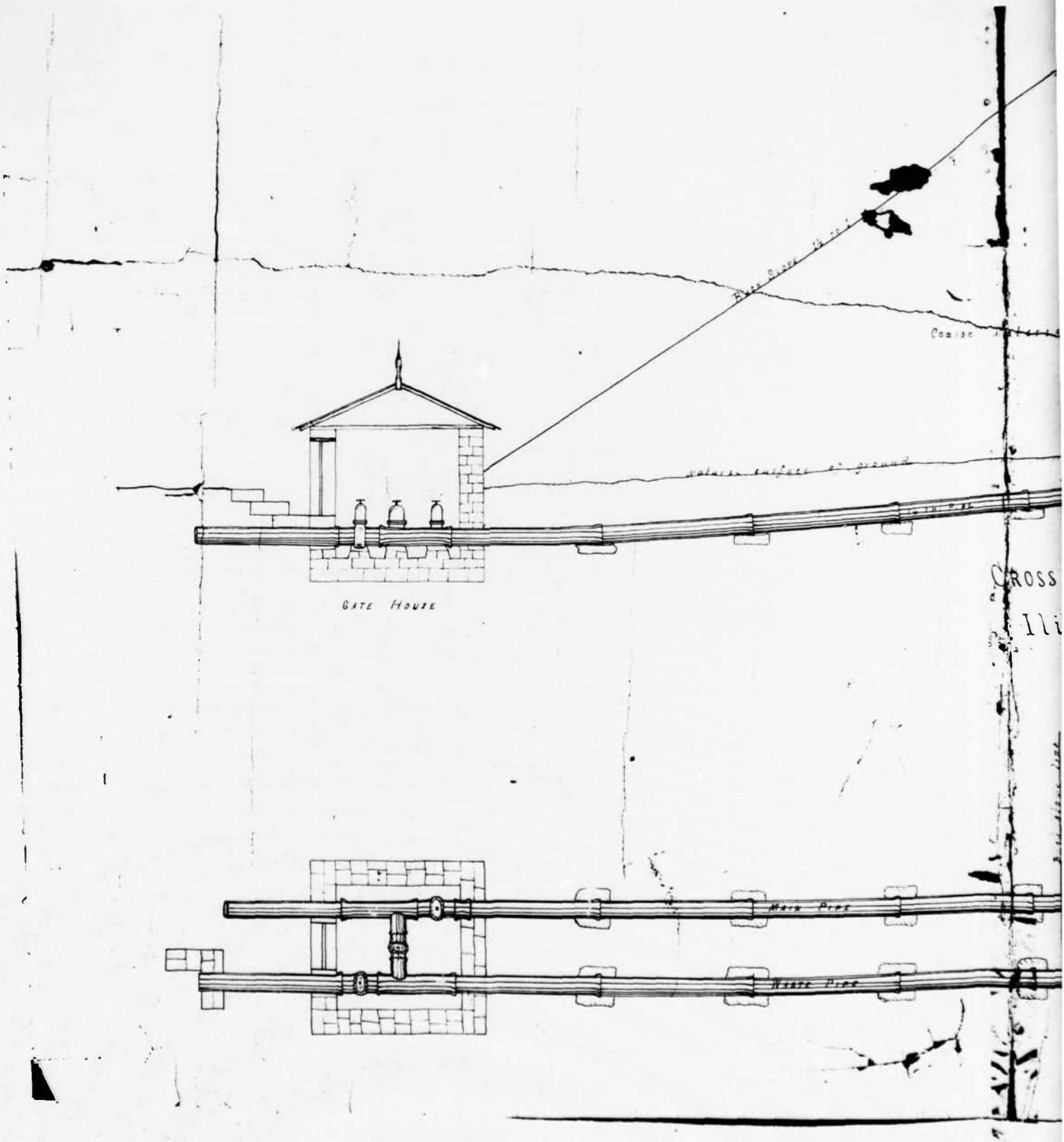
319.64
0.84 JOHNSON
3.036

OWNER

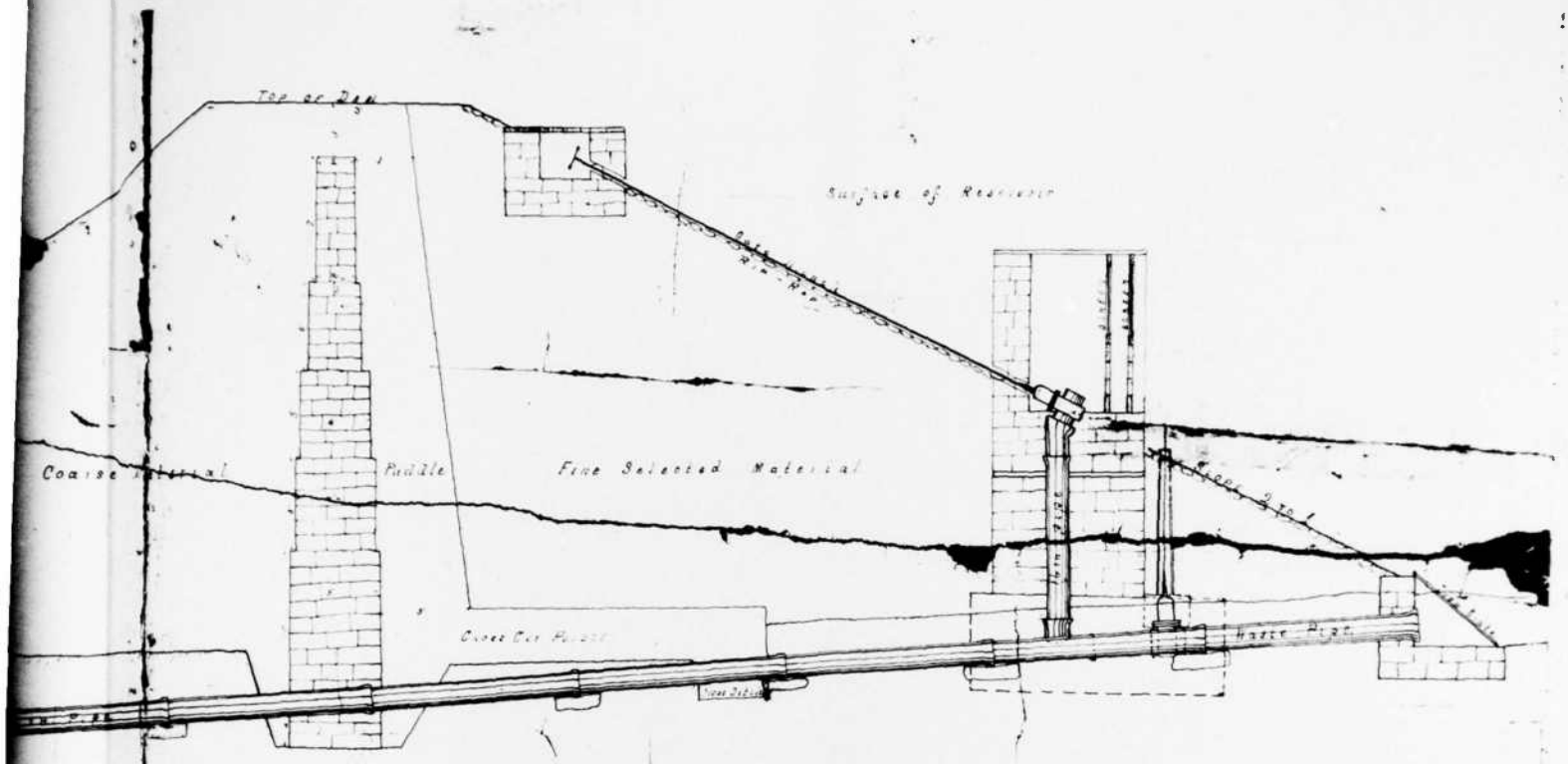
APPENDIX G

DRAWINGS

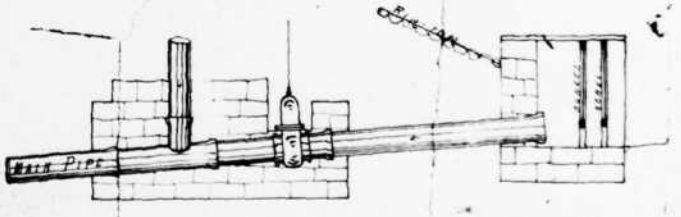
TABLE OF CONTENTS



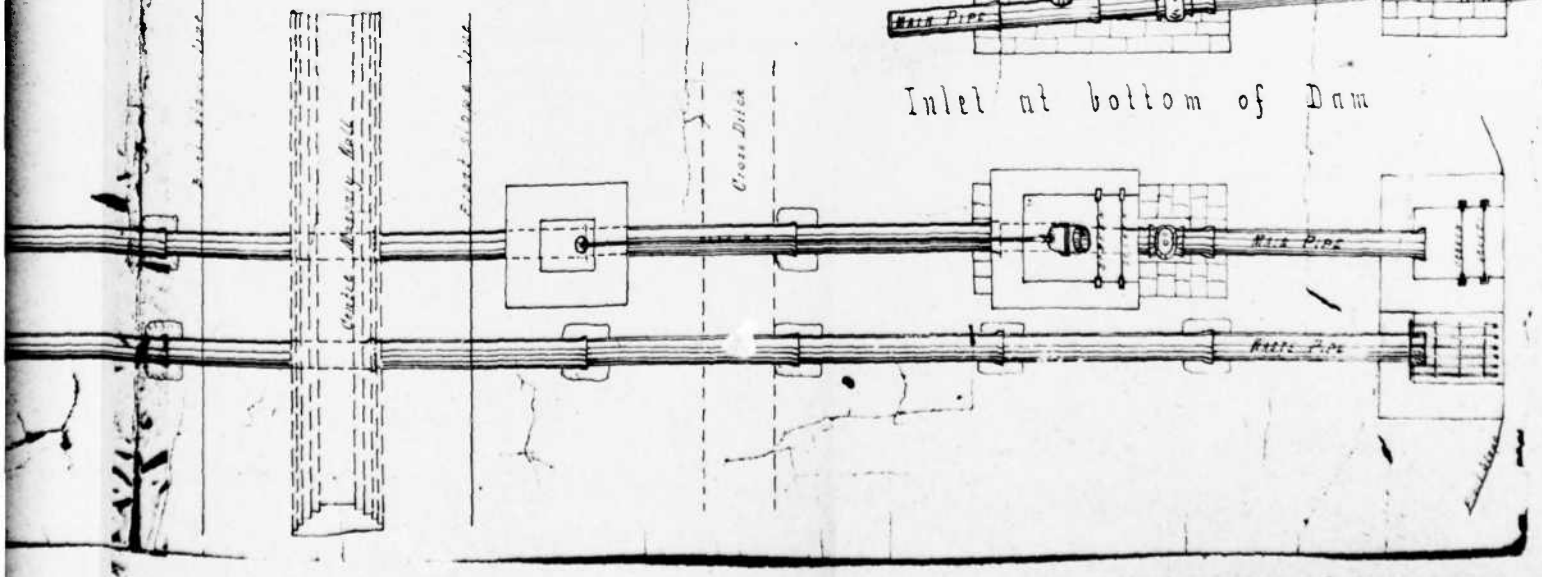
FROM OWNER
REDUCED TO 50% OF ORIGINAL



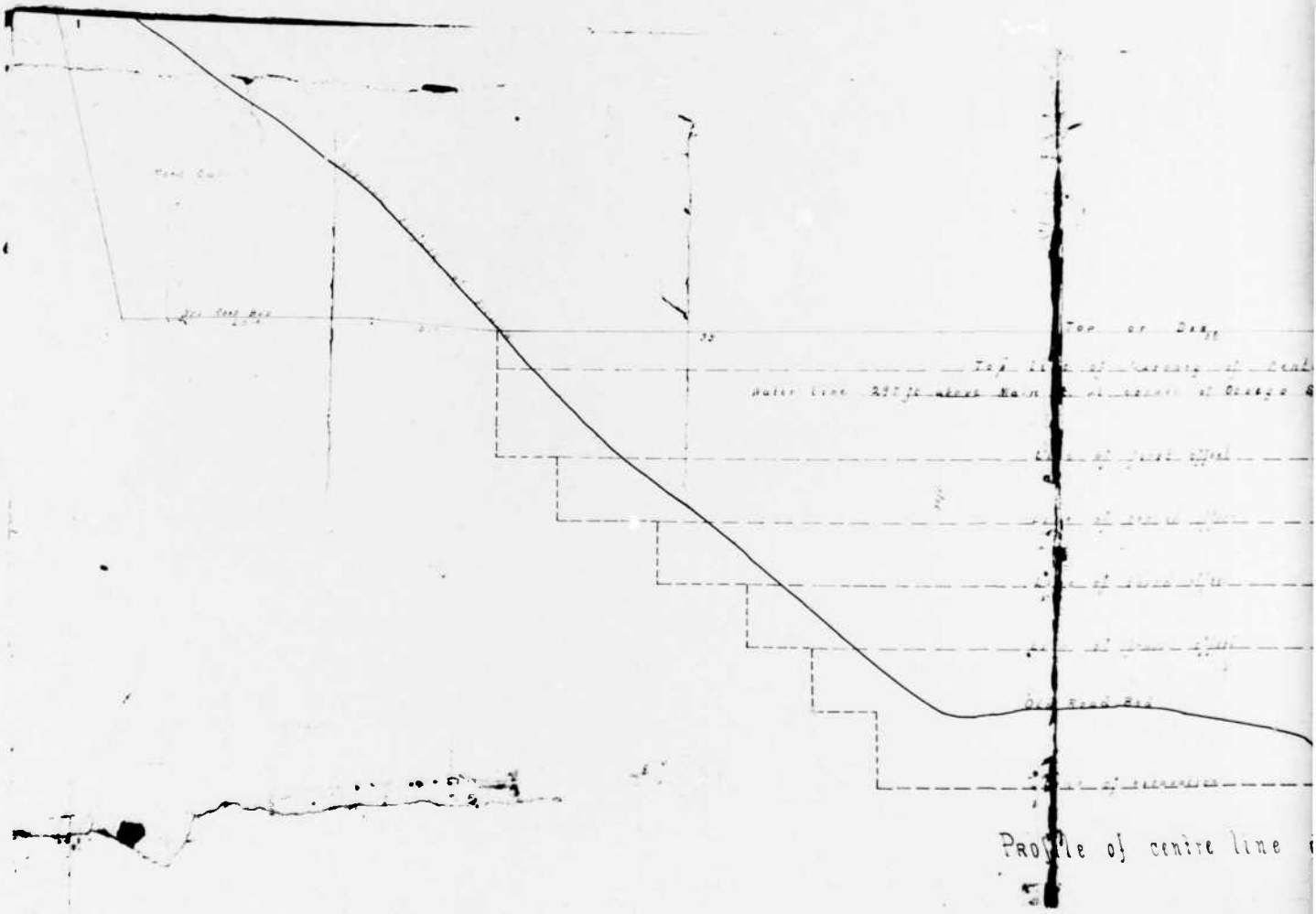
Cross section of Dam
for the
Ilion Water Works
Scale 5ft = 1 inch



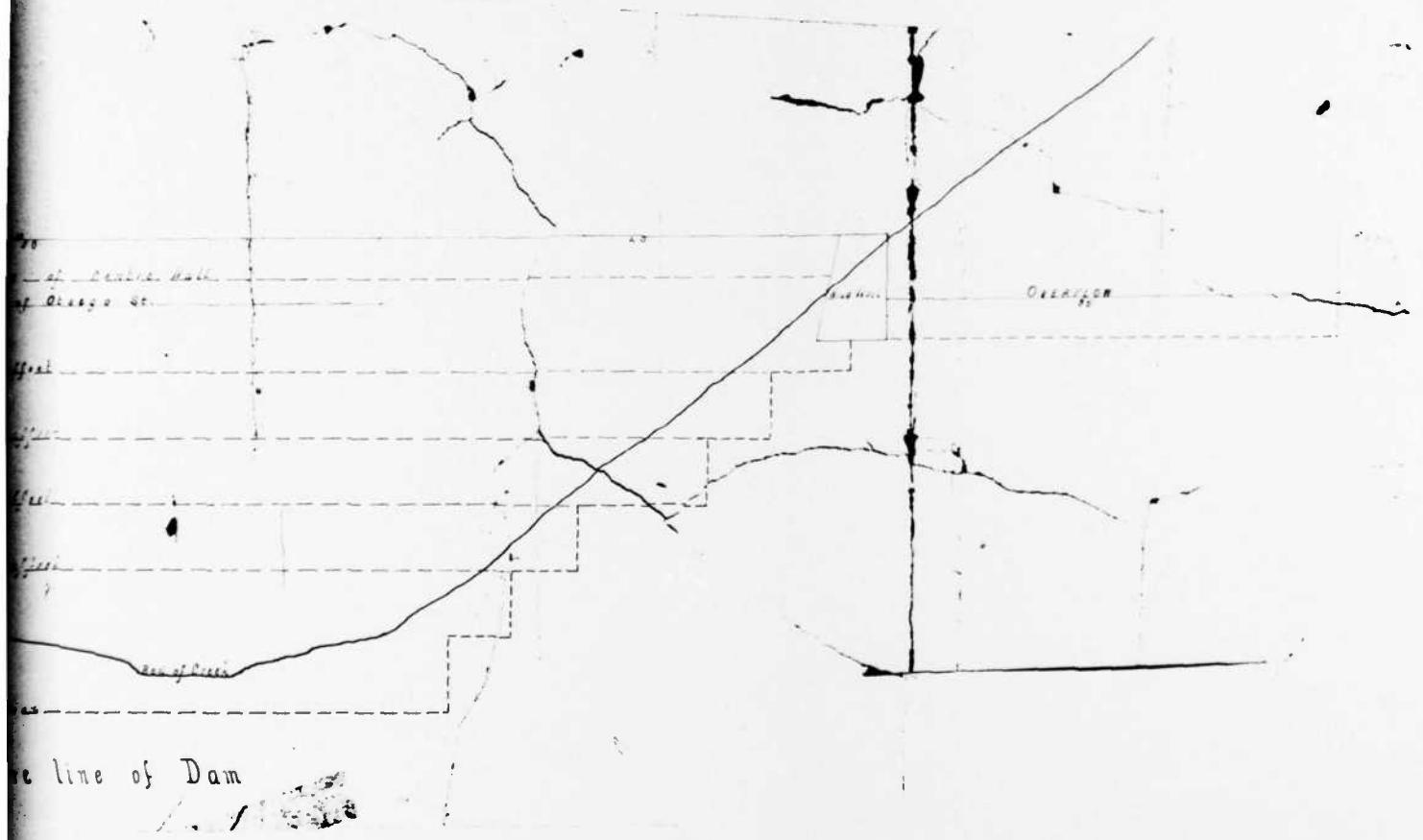
Inlet at bottom of Dam



G-1 CTM DWG NO. 81-50



FROM OWNER
REDUCED TO 39% OF ORIGINAL



e line of Dam

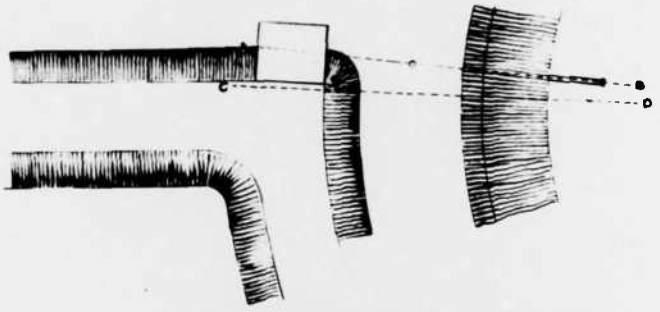
DETAILS OF RESERVOIR
ILION, N.Y. WATERWORKS

1892

SCALE

0 3 6 9 12

NO 1739



PLAN OF BASIN AND FLOOD WATER DITCH
AT WEST END OF RESERVOIR

SECTION A-B

SECTION C-D

SECTION

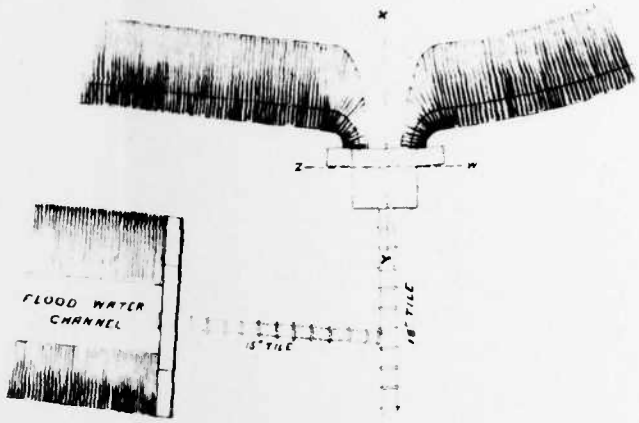
SECTIO

SECTION

SECTION A-B ON SIDE EMB

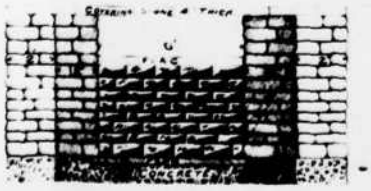
SECTION C-D ON SIDE EMB

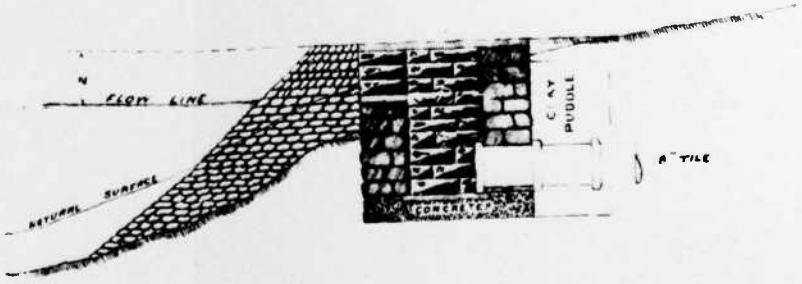
SECTION G-H ON SIDE EMB



PLAN OF OVERFLOW
SHOWING END OF FLOOD WATER CHANNEL

FRONT ELEVATION OVERFLOW



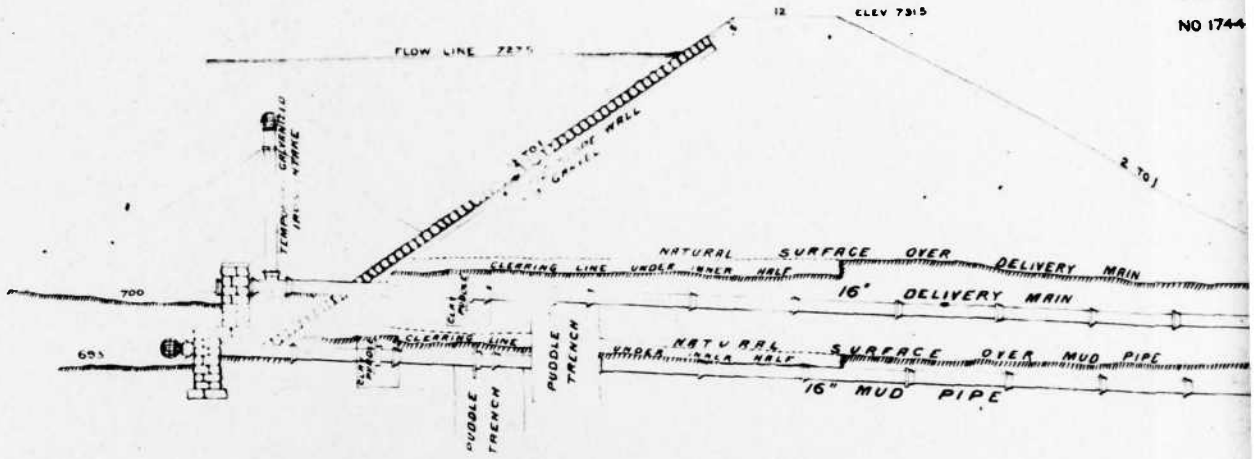


Z - W

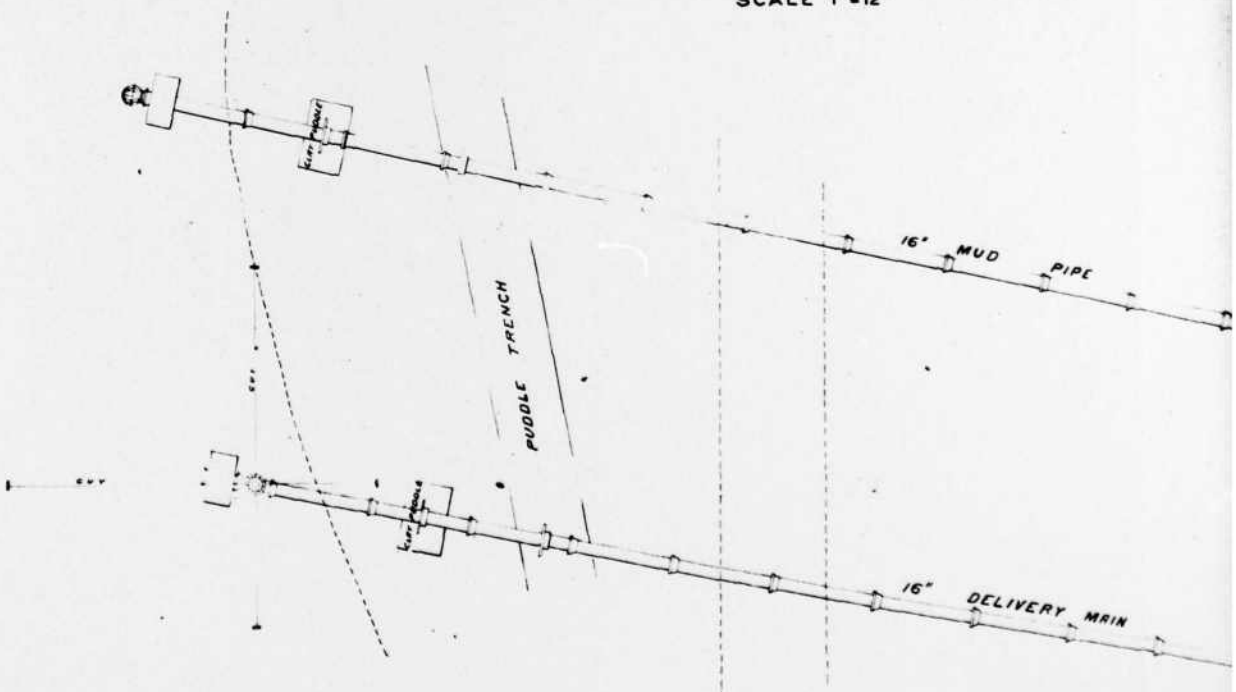
SECTIONS THROUGH OVERFLOW CHAMBER
SCALE 1/4" = 1'

X - Y

DETAILS OF R
ILION, N.Y. WAT
1892
NO 1744



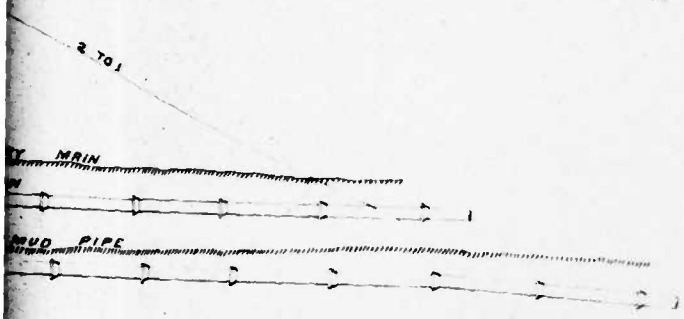
SECTION & PLAN SHOWING PIPES THROUGH EMBANKMENT
SCALE 1"=12'



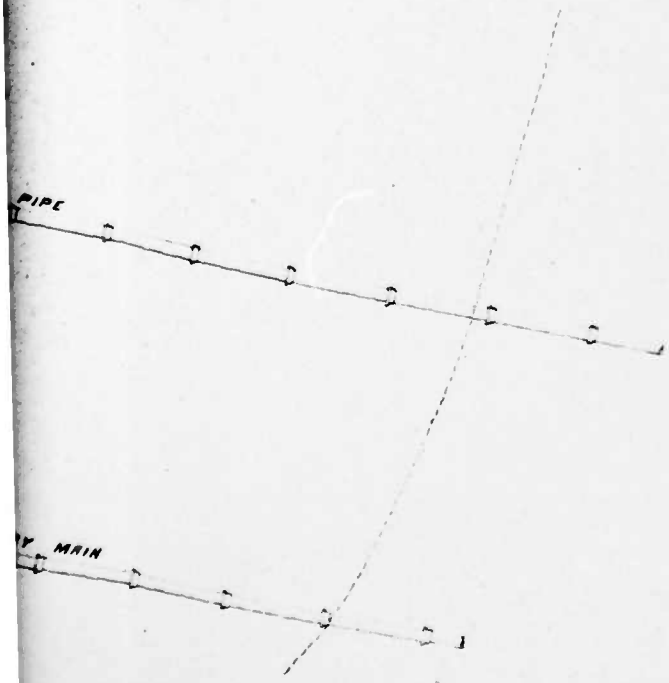
TAILS OF RESERVOIR
N, N.Y. WATERWORKS

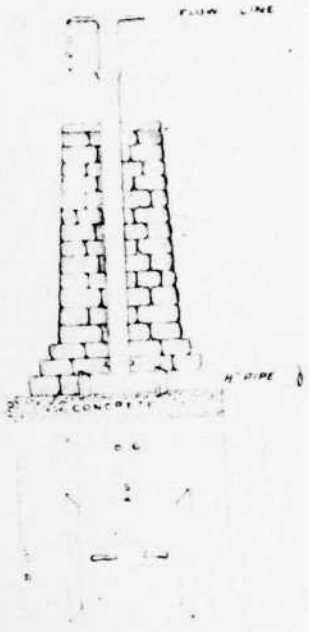
1892

NO 1744

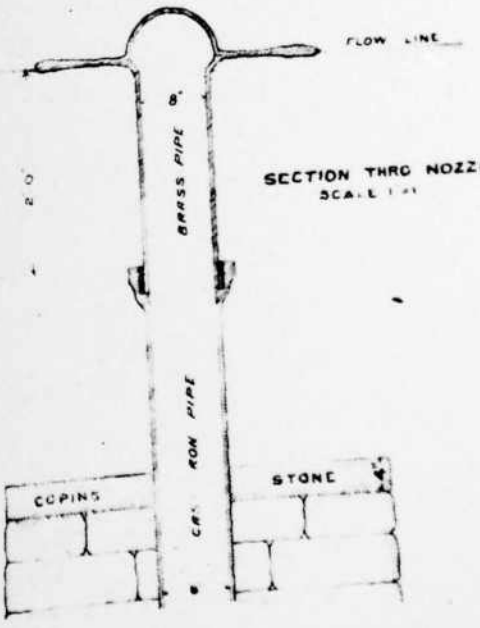


KMENT





SECTION & PLAN OF FOUNTAIN



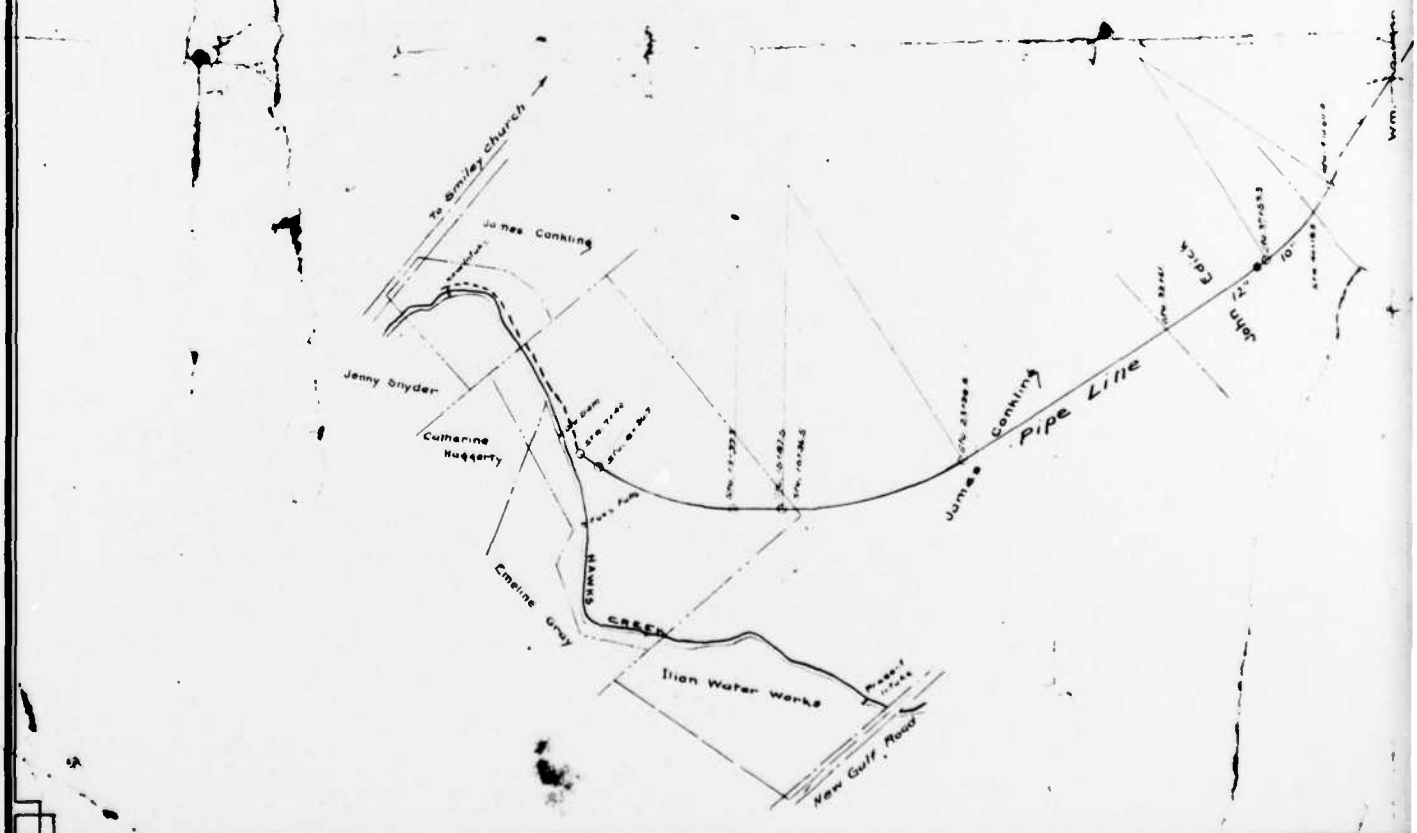
SECTION THRO NOZZLE

GENERAL PLAN
ILION, N.Y. WATER WORKS

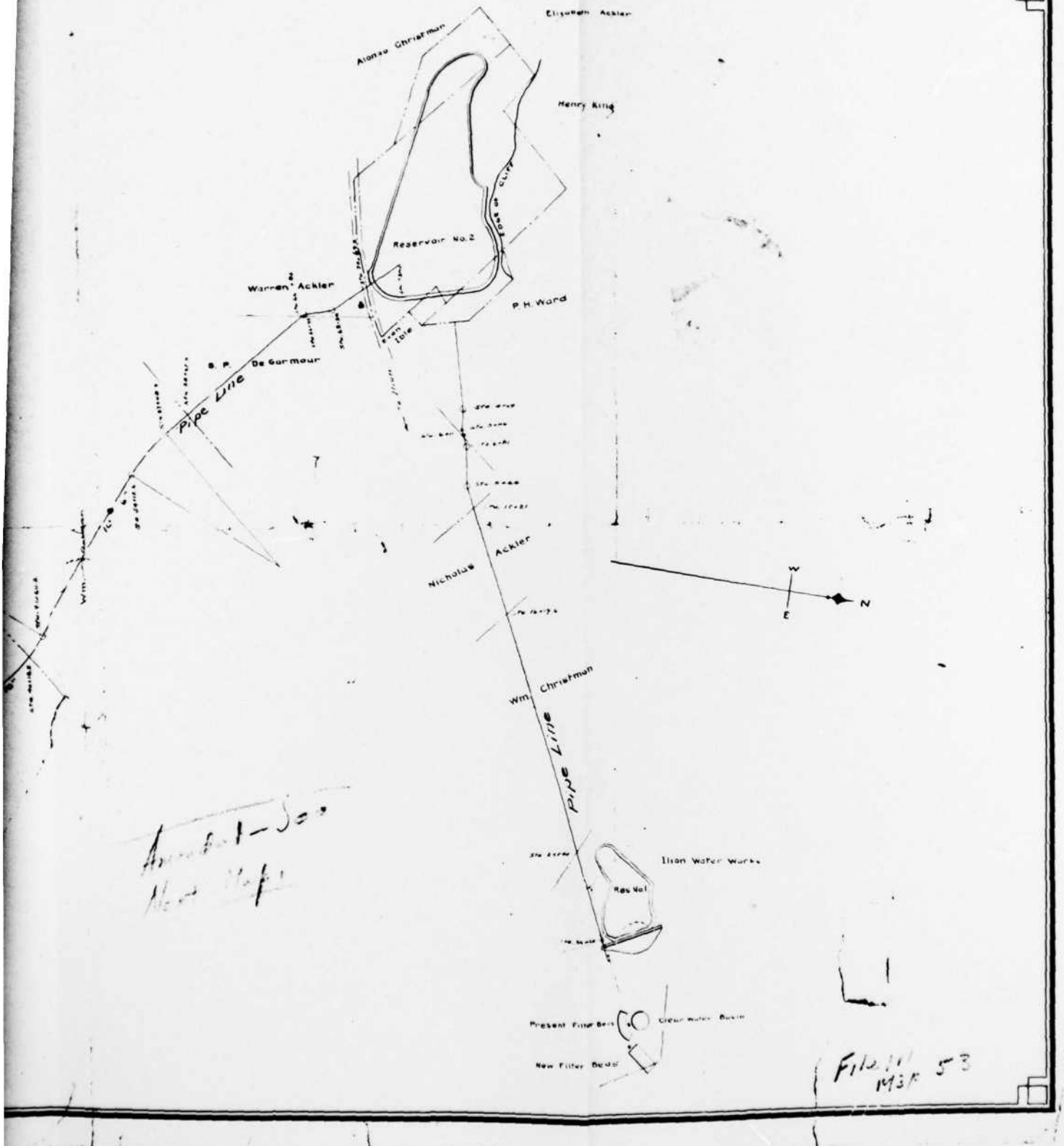
1903

Scale 1"=400'

Knight & Hopkins, Rome N.Y. Dwg #2604

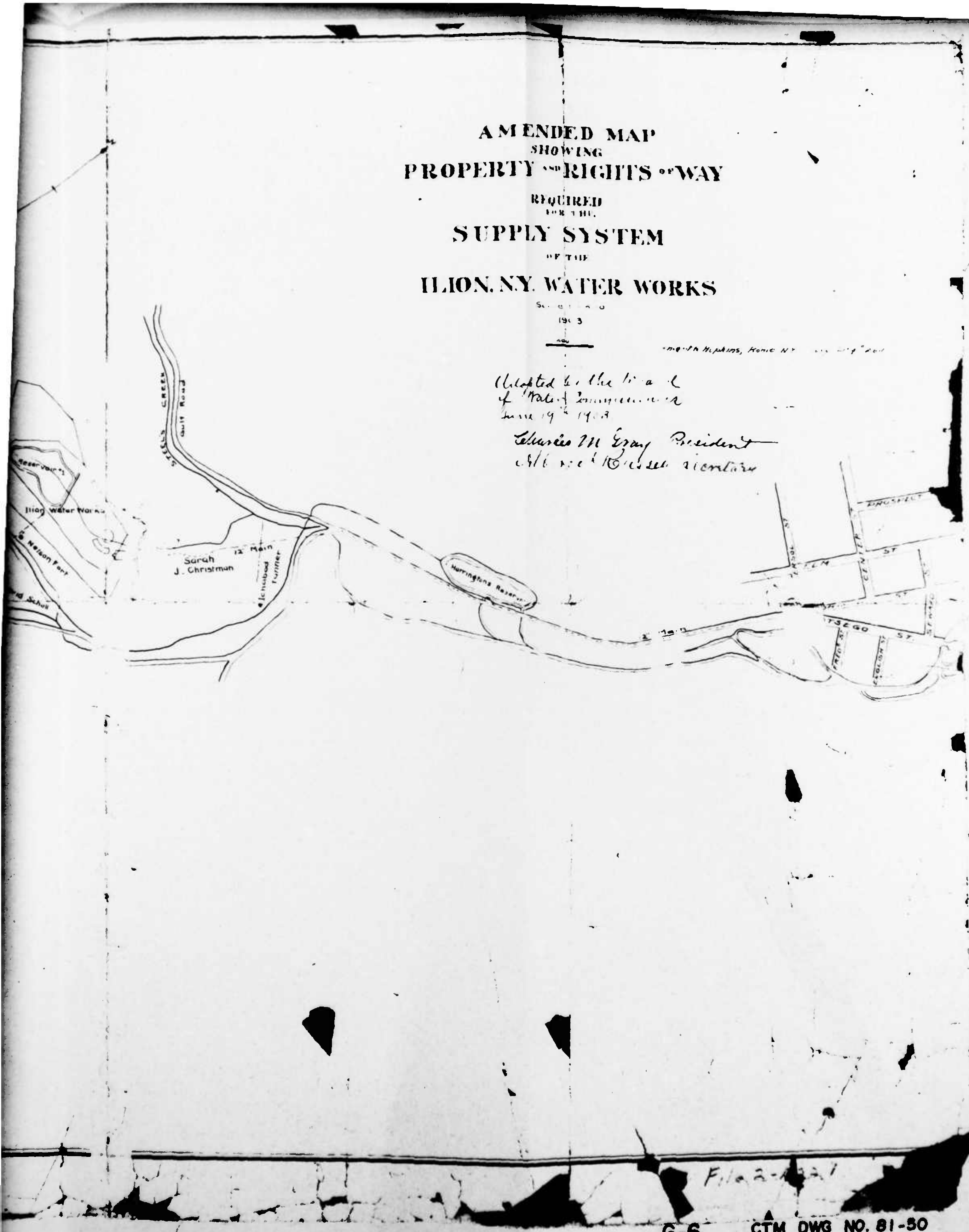


FROM OWNER
REDUCED TO 58% OF ORIGINAL



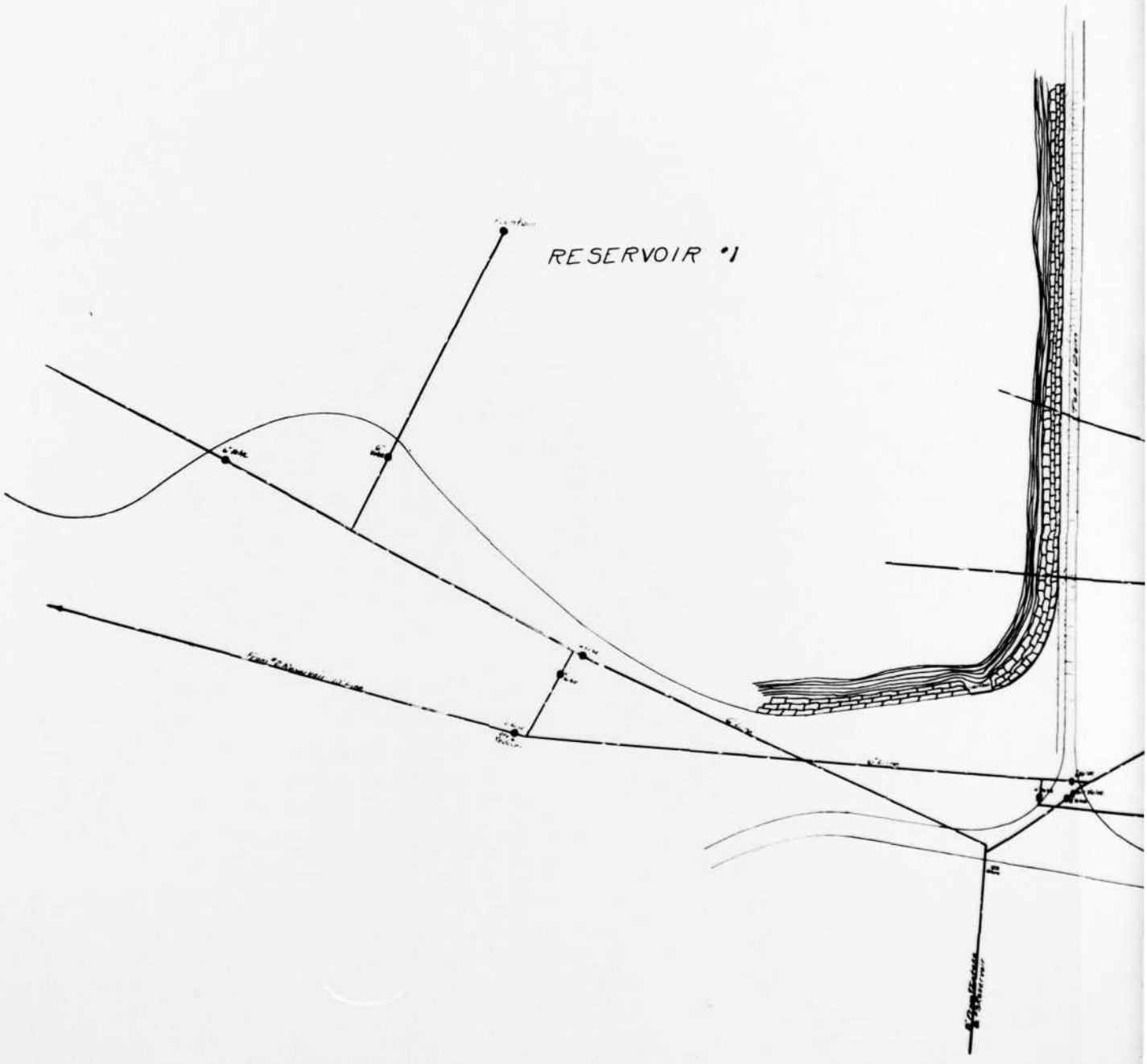
G-5 CTM DWG NO. 81-50

FROM OWNER
REDUCED TO 50% OF ORIGINAL



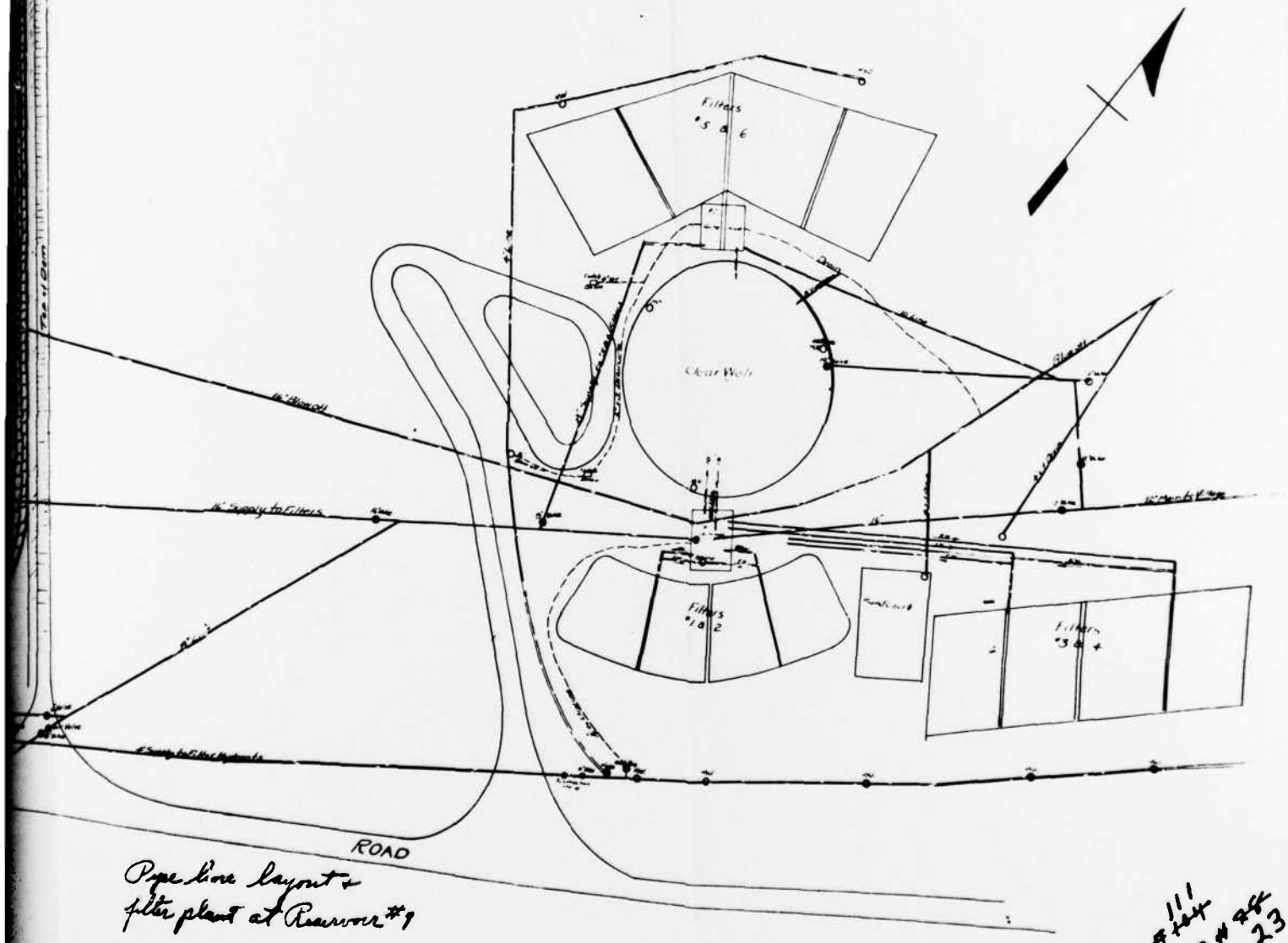
G-6

CTM DWG NO. 81-50



FROM OWNER
REDUCED TO 31 % OF ORIGINAL

MAP SHOWING DETAIL
in connection with
No. 1 RESERVOIR, ILION, NY.



Pipe line layout
filter plant at Reservoir #1

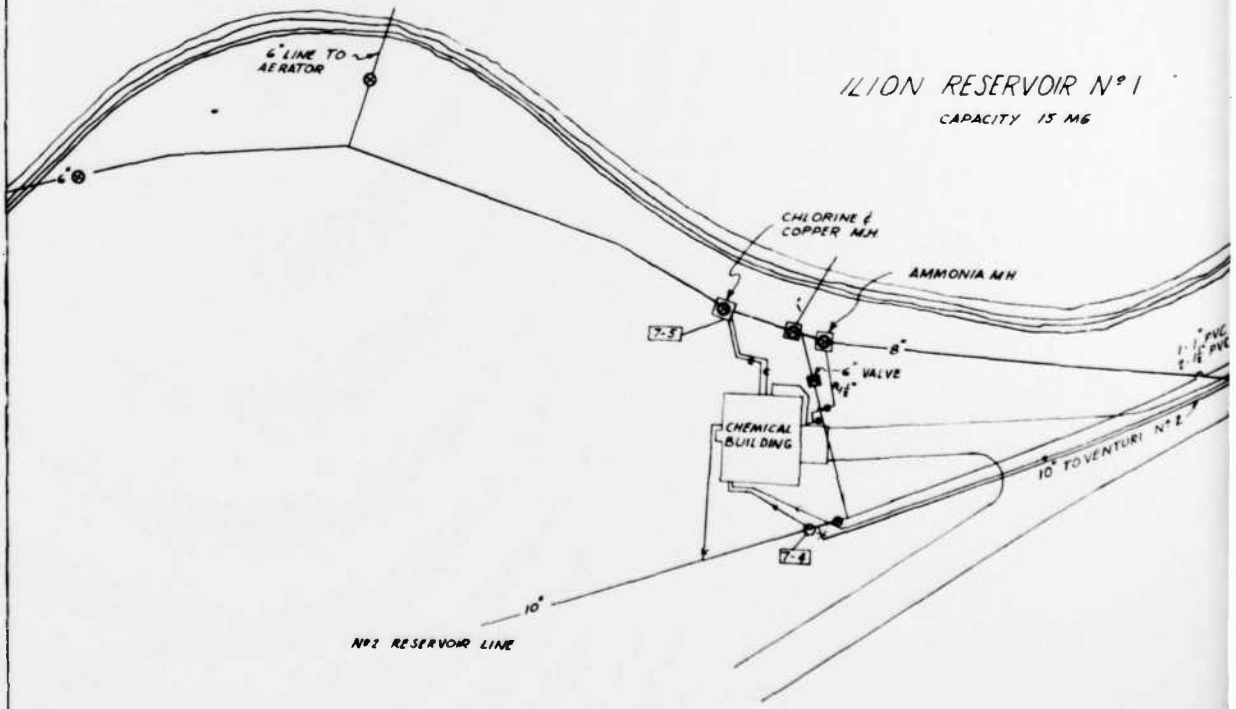
File # 111
Map # 44
23

G-7 CTM DWG NO. 81-50

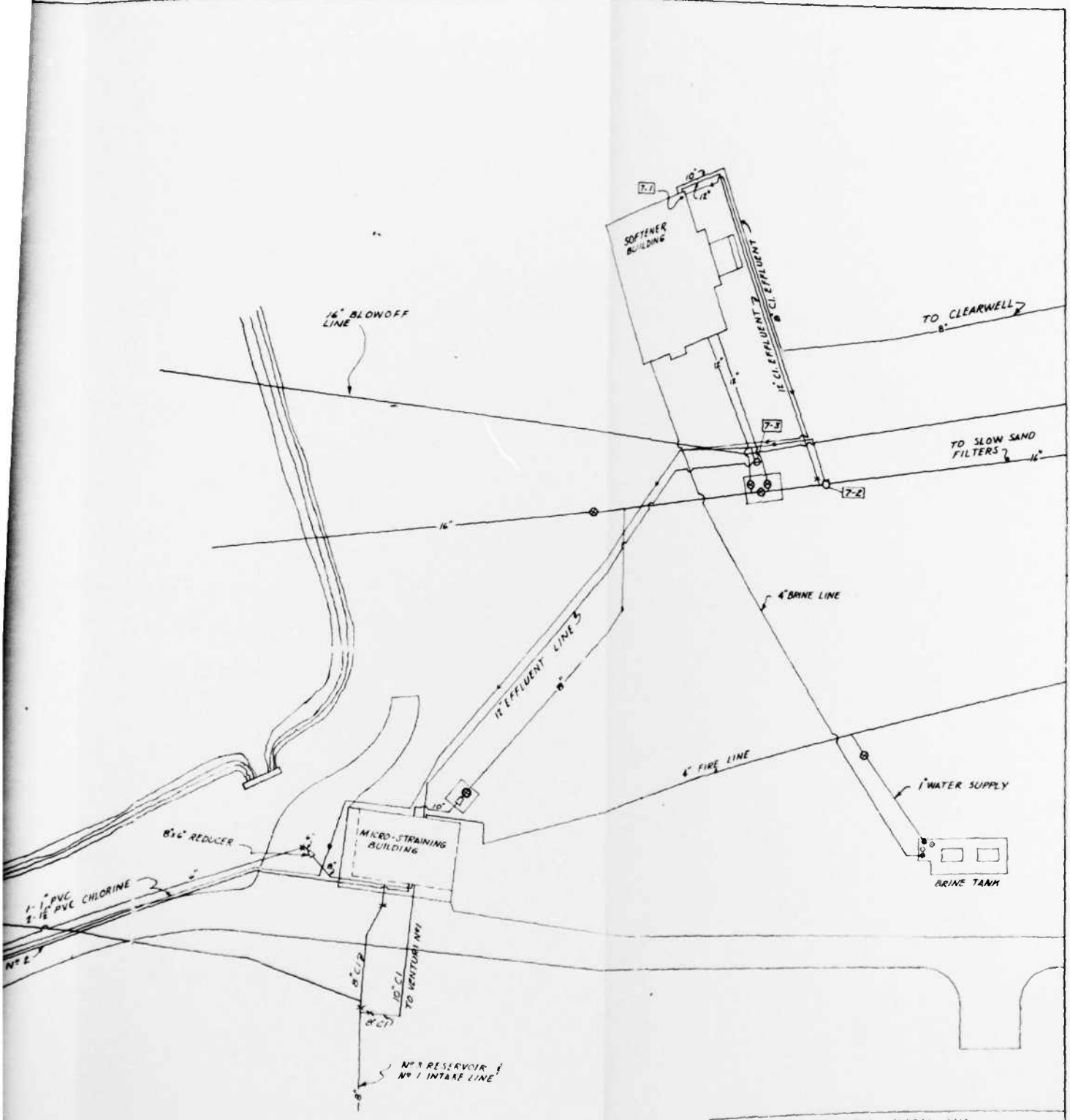
NOTES
FOR PIPE DESCIPTION SEE FILE "6 MAP "7 SHEET "3

CHLORINE LINE

POINT OF CHLORINE APPLICATION



FROM OWNER
NO SCALE



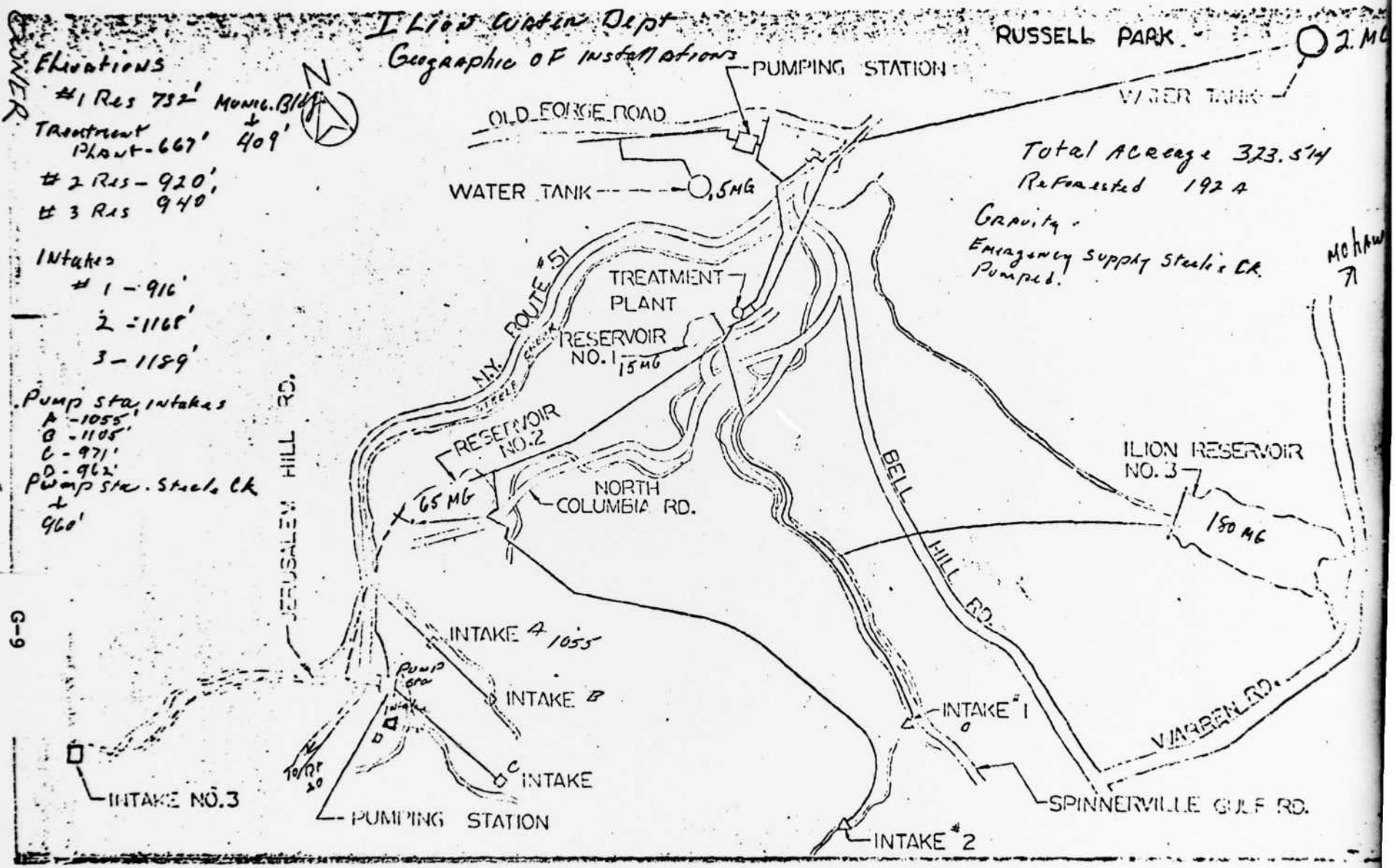
VILLAGE OF ILION, N.Y.
WATER TREATMENT FACILITIES

OUTSIDE PIPING
WATER LINES

DATE
8.5.65

DRAWN BY
EC Allison

G-8 CTM DWG NO. 81-50


Ilion Water Dept
Geographic of installations
Elevations
#1 Res 732' Mohic. Bldg + 409'
Treatment Plant - 667'
#2 Res - 920'
#3 Res 940'
Intakes
#1 - 916'
2 - 1168'
3 - 1189'
Pump sta. intakes
A - 1055'
B - 1105'
C - 971'
D - 962'
Pump sta. Steele Ck + 960'
RUSSELL PARK
2 MG
PUMPING STATION
WATER TANK
OLD FORGE ROAD
WATER TANK
0.5 MG
Total Acreage 323.514
Reforested 1924
Gravity -
Emergency supply Steele Ck Pumped.
N.Y. ROUTE 51
TREATMENT PLANT
RESERVOIR NO. 1
1.5 MG
RESERVOIR NO. 2
0.5 MG
NORTH COLUMBIA RD.
ILION RESERVOIR NO. 3
1.50 MG
BELL HILL RD.
JERUSALEM HILL RD.
INTAKE A 1055'
INTAKE B
INTAKE C
INTAKE NO. 3
PUMPING STATION
INTAKE #1
INTAKE #2
VANBENLO RD.
SPINNERVILLE GULF RD.
G-9


DATE
ILME